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Volume 1

Final Environmental Impact Statement

Withdrawal of Public Lands for Range Safety and Training Purposes Naval Air Station Fallon, Nevada

May 1998

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FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS) FOR THE WITHDRAWAL OF PUBLIC LANDS FOR RANGE SAFETY AND TRAINING PURPOSES AT NAVAL AIR STATION (NAS) FALLON, NEVADA

Lead Agency: US Department of the Navy

Cooperating Agency: US Bureau of Land Management

Title of Proposed Action: Final Environmental Impact Statement for the Withdrawal of Public Lands for Range Safety and Training Purposes at NAS Fallon, Nevada

Affected Jurisdictions: City of Fallon and Churchill County, Nevada

Designation: Final Environmental Impact Statement

ABSTRACT

The US Navy proposes to withdraw federally administered public land around the NAS Fallon Range Training Complex (FRTC) in Churchill County, Nevada. The purpose of this proposed action is to provide the necessary land area so the Navy can maintain and improve realistic operational and strategic combat training and to provide safety buffer zones around the training ranges. Three alternative withdrawal footprints were evaluated for potential environmental impacts, in addition to the no action alternative. The withdrawn lands would be placed in land use categories to define compatible uses with training operations and public safety. Category A lands, identified as containing or having the potential to contain off-range ordnance, would be closed to public access. Category B lands would include all other withdrawn lands and would be open for public use. In response to concerns from individuals and officials voiced during scoping, Alternative II, the preferred alternative, fulfills known safety and training requirements while attempting to minimize the amount of land proposed for withdrawal (127,365 acres). The no action alternative would not withdraw any lands, including those lands identified as containing off-range ordnance. "No action" would not meet training requirements nor provide for other public safety measures. Impacts of the withdrawal include the closure of public access on lands containing or having the potential to contain off-range ordnance and potential effects to mining, visual resources, and recreation from development of small sites and from integrated air and ground training activities. Mitigation measures are provided to reduce the level of impact.

For Further Information:

Naval Facilities Engineering Command
Engineering Field Activity West
900 Commodore Drive
San Bruno, CA 94066-0720
Attn: Mr. Sam Dennis
Phone: (650) 244-3007
Fax: (650) 244-3206

May 1998

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADDU	Additional Duty
AFB	Air Force Base
AFY	Acre-Feet Per Year
AG	Agricultural
AG/LDR	Agricultural/Low Density Residential
AGL	Above Ground Level
AICUZ	Air Installation Compatible Use Zone
AR	Air Refueling Route
ATCAA	Air Traffic Control Assigned Airspace
AUM	Animal Unit Month
BLM	Bureau of Land Management
BOM	US Bureau of Mines
BRAC	Base Realignment and Closure
BUREC	Bureau of Reclamation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
CNO	Chief of Naval Operations
CO	Commanding Officer
CO	Carbon Monoxide
CO NASF	Commanding Officer, NAS Fallon
COE	Army Corps of Engineers
CRMP	Cultural Resource Management Plan
CVW	Carrier Air Wing
CWA	Clean Water Act
dB	Decibel
dBA	A-Weighted Decibel
DBCRA	Defense Base Closure and Realignment Act
DEIS	Draft Environmental Impact Statement
DOD	Department of Defense
DOE	Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMR	Electromagnetic radiation
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EW	Electronic Warfare
FAA	Federal Aviation Administration
FERC	Federal Electric Regulatory Commission
FL	Flight Level
FLPMA	Federal Land Policy Management Act
FRS	Fleet Replacement Squadrons
FRTC	Fallon Range Training Complex
H_2S	Hydrogen sulfide
HC	Hydrocarbons
HMA	herd management area
HWAD	Hawthorne Army Depot

IFR	Instrument Flight Rules
IMP	Interim Management Policy
IWTS	Imaging Weapons Training System
Ldn	Day-Night Average Noise Level
LEIS	Legislative Environmental Impact Statement
Leq	Equivalent Noise Level
MCAS	Marine Corps Air Station
MOA	Military Operations Area
MOU	Memorandum of Understanding
MSL	Mean Sea Level
MTADS	Multi-sensor Towed Array Detection System
MTR	Military Training Route
NAS	Naval Air Station Fallon
NBMG	Nevada Bureau of Mines and Geology
NDOT	Nevada Department of Transportation
NDOW	Nevada Division of Wildlife
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNNPS	Northern Nevada Native Plant Society
NOI	Notice of Intent
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NSAWC	Naval Strike and Air Warfare Center
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
NZ	Noise Zones
O_3	Ozone
O&M	Operations and Maintenance
OPNAVINST 5090.1B	Dept. of the Navy Environmental and Natural Resources Program Manual
ORV	Off-Road Vehicle
PA	Programmatic Agreement
Pb	Lead
PL	Public Law
PLO	Public Land Order
PM_{10}	Inhalable Particulate Matter
RAICUZ	Range Air Installation Compatibility Use Zone
RCTC	Reserve Component Training Center
RMP	Resource Management Plan
ROI	Region of Influence
ROW	Right-of-Way
RSZ	Range Safety Zone
SAM	Surface-to-Air Missile
SEAL	Sea-Air-Land
SEL	Single Event Level
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SUA	Special Use Airspace

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T&E	Test and Evaluation
TACTS	Tactical Aircrew Combat Training System
TCID	Truckee-Carson Irrigation District
TIS	Tracking Instrumentation Subsystem
Top Dome	Carrier Airborne Early Warning Weapons School
TOPGUN	Naval Fighter Weapons School
USC	United States Code
USDA	US Department of Agriculture
USFWS	US Fish and Wildlife Service
VFR	Visual Flight Rules
VRM	Visual Resource Management
WISS	Weapons Impact Scoring System
WSA	Wilderness Study Area

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EXECUTIVE SUMMARY

INTRODUCTION

This final environmental impact statement (FEIS), for an action previously referred to as the Master Land Withdrawal, evaluates the potential impacts to the environment that may result from the withdrawal of federally administered public land adjacent to the training ranges at Naval Air Station (NAS) Fallon, Nevada. The withdrawal will not cause an increase in air operations or increase the size of the impact areas within the ranges, but is designed to improve the realistic operational and strategic combat training at Fallon and to increase control and management of safety buffers and areas where off-range ordnance has been found. This FEIS has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations on implementing NEPA (40 CFR 1500-1508), and Navy guidelines (OPNAVINST 5090.1B). The Navy is the lead agency for the withdrawal action, with the Bureau of Land Management (BLM) acting as a cooperating agency.

PURPOSE AND NEED

Improve Realistic Operational and Strategic Combat Training

The mission of NAS Fallon is to provide facilities (including training ranges), services, and materials to tenants and transient units stationed at or being deployed to NAS Fallon for Chief of Naval Operations (CNO) approved aviation training. The Naval Strike and Air Warfare Center (NSAWC) is the major tenant command. NSAWC develops realistic combat training scenarios for military aircrews flying high-performance jet aircraft and helicopters, employing state of the art military equipment and tactics. NSAWC operates, maintains, schedules, develops, and configures the Fallon Range Training Complex (FRTC).

NAS Fallon is the only Navy facility that can support, train, and house an entire carrier air wing (CVW) for initial and refresher integrated strike training. A CVW consists of all aircraft, pilots, crew, and aircraft maintenance personnel assigned to an aircraft carrier. NAS Fallon hosts four to six CVWs and up to two Marine air wings per year for an intensive four-week training program prior to their scheduled deployment aboard aircraft carriers or to air stations overseas (US Navy 1995e). In addition to CVWs, NAS Fallon hosts a fleet replacement squadron (FRS) detachment. The FRS detachment is based permanently at NAS Fallon and operates a maintenance facility for F/A-18s from NAS Lemoore, California, and NAS Cecil Field, Florida, the respective

West Coast and East Coast Hornet fleet replacement squadrons (US Navy 1995e).

In addition to aircraft training, the NSAWC mission supports integrated ground and aircraft training, including combat search and rescue training. Combat search and rescue consists of integrated training with ground personnel and helicopter and fixed wing air support. The objective of the training is rescuing and transporting ground personnel, such as downed pilots, from within enemy territory. NAS Fallon is the only Navy facility where the combat search and rescue training mission is conducted. Ground training at NAS Fallon occurs only as a component of the integrated air and ground training mission; it is not a stand-alone mission. More than 90 percent of the integrated air and ground training takes place during the week, and approximately 50 percent of the training occurs at night.

Some Navy training, such as limited ground training activities, has historically made use of public lands under the management of the Bureau of Land Management, Department of Interior. Those uses are coordinated with the BLM or other appropriate agencies.

Changes in technology and military strategy require that NAS Fallon change and improve its operational and strategic combat training. In order to achieve the most realistic combat training possible, NAS Fallon needs to have the flexibility to develop visual cueing device sites and additional electronic warfare (EW) and tactical aircrew combat training systems (TACTS) sites. NAS Fallon needs to simulate real world conditions for integrated air and ground operations training. Such conditions require large corridors of land with varying terrain (Section 1.4.1). These changes and improvements cannot be effectively carried out on present withdrawn land configurations, even with relatively minor additions to the use of public lands. This proposal to withdraw additional land is calculated to provide the necessary area for effective national defense training and to minimize disruption of the BLM mission to provide for multiple uses on federal lands.

Increase Control and Management of Safety Buffers and Areas Where Off-range Ordnance Has Been Found

Several Navy studies identified safety hazards associated with the NAS Fallon training ranges. These studies include the off-range ordnance sweeps conducted near the ranges in 1989 and 1990 (US Navy 1990), the Range Air Installation Compatible Use Zones (RAICUZ) Study (US Navy 1982b), an updated RAICUZ study for B-16 (US Navy 1995, 1997), and the Hazard Analysis Mitigation Report (US Navy 1995g). These studies pointed out the need for a land withdrawal to increase public safety (Section 1.4.3).

The Naval Air Station Fallon Ranges Hazard Analysis Mitigation Report used the HAZARD methodology to identify lands surrounding the training ranges that have the potential to be contaminated with off-range ordnance for would be withdrawn (Figure 1-3) (US Navy 1995g). A recent B-16 RAICUZ study provided revised safety footprints for B-16 (US Navy 1995h). This study is based on noise data presented in two recent noise studies for B-16 (see Section 5.6.4.7), updated weapon safety footprints (see Section 1.4.3.1), and armed overflight zones (see Section 1.4.3.4).

Off-range ordnance sweeps conducted in 1989 and 1990 found surface ordnance on 24,464 acres of land adjacent to the B-16, B-17, and B-19 training ranges (Figure 1-5). Analysis determined that these lands, now administered by the BLM, should be closed to protect the public from exposure to ordnance hazards (US Navy 1990). The Navy and BLM are in agreement that such closed properties should be withdrawn and placed under Navy control and management.

The 1982 RAICUZ study identified areas surrounding the training ranges where the possibility of accidents and the level of noise from Navy activities exceed Navy guidelines for nonmilitary land uses. The RAICUZ analysis was used to determine the original land withdrawal footprint (Alternative I). More recent studies conducted to address range safety requirements, described above, led to the revision of the RAICUZ findings. A summary of the 1982 RAICUZ report is presented in this FEIS to explain Alternative I. The other alternatives evaluated in this FEIS reflect the findings of more recent studies.

PROPOSED ACTION

The Navy proposes to withdraw federally administered land around NAS Fallon training ranges to facilitate and improve the realistic operational and strategic combat training conducted there and to provide public safety buffers. All lands proposed for withdrawal are administered by the BLM, Bureau of Reclamation (BUREC), or Department of Energy (DOE). The land within the proposed action is expected to fulfill the majority of the training requirement. Any military use that becomes necessary outside of the proposed withdrawal footprint would continue to be coordinated with the BLM or other appropriate agency.

Three action alternatives are evaluated in detail. These alternatives would withdraw between 127,365 and 189,080 acres of public land around the NAS Fallon training ranges B-16, B-17, B-19, the shoal site, and the Dixie Valley area. The total of all the alternative withdrawal footprints would include lands north, west, and southeast of B-16; lands north, south, east, and west of B-17; and lands north, west, and east of B-19. Lands at the shoal site and Dixie Valley area also are included for withdrawal. Under each action alternative, all lands known to be contaminated or having the potential to be contaminated with off-range ordnance would be withdrawn (Sections 1.4.3.1 and 1.4.3.3). Specific acreages and maps of the withdrawal areas for each alternative are presented in Sections 2.2.2. and 2.3.3.

The withdrawn lands under each alternative would be placed in one of two land use categories—Category A, Exclusive Navy Use, Potential Ordnance Hazard; or Category B, Navy and Public Use, Limited Land Use Conflicts. Category A includes approximately 40,280 acres of land east of B-16, north, south, and east of B-17, and north and east of B-19. Category B includes all remaining withdrawal lands.

Category A lands will be managed by the Navy and will be closed to public uses. Category B lands will be managed by the BLM with Navy review and approval of certain activities and will remain open to public use with the exception of fenced EW sites. All lands will be managed under a resource management plan that has been developed by the Navy, in consultation with the BLM, BUREC, and DOE. This management plan provides specific land use policies for the withdrawn lands in conformance to the proposed action (Section 2.3.2 summarizes the plan, which is presented in Appendix J).

Up to five EW or TACTS sites and up to 50 sites for visual cueing devices could be developed on the withdrawn lands. Each EW site would occupy fewer than five acres, and each TACTS and visual cueing device site would occupy up to one acre. The maximum land area that would be disturbed if five EW sites and 50 visual cueing device sites were developed would be 75 acres. Although the exact locations of these sites have not been identified, all will be located on withdrawn lands in the Dixie and Fairview Valley areas and east of B-19 where possible. Not all visual cueing device sites would be occupied at one time (i.e., there would never be 50 visual cueing devices on the withdrawn lands at one time). Typically, three to six visual cueing devices are used at a time during air wing training events.

Integrated air and ground training activities will take place on the withdrawn lands. A typical ground training portion of the exercise associated with the four to six air wing training events will consist of up to two vehicles, up to two helicopters, and up to six personnel. Under desert rescue scenarios, which now occur once a year for three weeks, the most intensive training event will consist of four vehicles, two helicopters, and up to 15 personnel. Not all of these forces will be located at the same site at the same time. The Navy will avoid other public land users when conducting ground training operations. Chaff and flares will continue to be dispensed from aircraft over B-17 and the Dixie and Fairview Valleys. These activities are described in detail in Section 2.3.1.

All EW, TACTS, and visual cueing device sites will be located away from sensitive resources where possible to avoid adverse impacts and will undergo National Historic Preservation Act Section 106 and federal Endangered Species Act Section 7 consultations, as appropriate. All actions at the shoal site would take place at or above the ground surface— no subsurface disturbance is proposed.

Any military use that becomes necessary outside of the proposed withdrawal footprint would continue to be coordinated with the BLM or other appropriate agency; the proposed land withdrawal alleviates the need to use other BLM lands in most cases.

PUBLIC INVOLVEMENT

Public Scoping. Public issues and concerns were solicited during the public scoping process conducted from May 12 through July 7, 1995. Notices describing the proposed withdrawal and preparation of the EIS were published in the Federal Register and two local newspapers. Scoping letters also were mailed to over 200 agencies, organizations, and individuals. Public scoping meetings were conducted in Reno, Nevada, on June 6, 1995, and in Fallon, Nevada, on June 7, 1995.

Comments addressed public land access, airspace safety and availability, noise levels, biological resources, water supply and rights, socioeconomic effects, land use compatibility, public health and safety, and cultural resources. Respondents requested that the EIS address a full range of alternatives, including relocating B-16, and present the alternative selection process.

Comments urged NAS Fallon to make the best use of lands currently under its management and to withdraw the least amount of land possible. In response, the proposed configuration was changed to include a corridor of Navy-owned land connecting to the Dixie Valley area proposed for withdrawal.

In response to public scoping comments related to noise north of B-16 in the Sheckler District, the Navy initiated operational changes at B-16. These changes, discussed in Section 5.6.3, would revise current flight patterns to reduce noise levels north of B-16 in the Sheckler District. The BLM published a NOI for these modifications in the Federal Register and held an open house on July 17, 1996, to discuss these changes.

Draft EIS. The public was invited to review and comment on the DEIS. A notice of availability was published in the Federal Register on July 10, 1997. Public notices were mailed to those on the mailing list (Appendix B). Ads were published in the Reno Gazette and Lahontan Valley News on September

8 and 9, 1997, and September 14 and 15, 1997. The DEIS was circulated for public and agency review from July 10, 1997 to October 10, 1997. This public comment period of 90 days (required to be at least 45 days under NEPA) provided an opportunity for the public to review the issues addressed in the impact analysis and to offer comments on any aspect of the process. The distribution list is included as Appendix B.

Public hearings were held on September 16, 1997, in Reno, Nevada, and on September 17, 1997, in Fallon, Nevada, to formally receive verbal and written comments on the DEIS. The locations, dates, and times of the meetings were announced in the media and were included in a letter mailed to those on the distribution list. Open houses were held prior to each public meeting to give the public an opportunity to discuss their concerns with Navy representatives. Approximately 30 individuals attended the open house, 60 individuals attended the public hearing, and 23 individuals presented oral comments in Reno, Nevada. Approximately 16 individuals attended the open house, 52 individuals attended the public hearing, and 15 individuals presented oral comments in Fallon, Nevada. Comments and responses to the comments are provided as Volume II of this FEIS. An additional meeting was held in Austin, Nevada on September 30, 1997, to respond to concerns of citizens of Eureka, Nye, and Lander Counties voiced at the Reno and Fallon public hearings. Approximately 50 individuals attended this meeting.

Final EIS. This FEIS incorporates and responds to comments received on the DEIS. As required under NEPA, there will be a 30-day no action period after the FEIS is published. After the 30-day no action period, a Record of Decision (ROD) will be prepared.

ALTERNATIVES

Three action alternatives were determined to meet the identified purpose and need, and these are analyzed in detail in the FEIS. Alternative II has been selected as the preferred alternative because it minimizes the amount of land proposed for withdrawal. All action alternatives considered withdraw the lands known to contain off-range ordnance. The three alternatives and the No Action Alternative are summarized below:

- *Alternative I.* Approximately 189,080 acres would be withdrawn. The withdrawal footprint would include all lands recommended for withdrawal in the 1982 RAICUZ study (181,323 acres) plus additional lands closed as a result of off-range ordnance sweeps but not included within the original RAICUZ footprint (7,750 acres). This alternative represents the footprint of the original Master Land Withdrawal proposal, as amended in 1992.

This alternative meets safety requirements and provides adequate land for EW and TACTS site development in the Dixie and Fairview Valley area and east of B-19. The footprint, however, does not contain a corridor connecting the Navy-owned Dixie Valley land holdings with the rest of the Dixie Valley area. Such a corridor is important in maximizing the use of existing Navy land and in providing the necessary land for integrated air and ground training (see Section 1.4.2).

- *Alternative II (Preferred Alternative).* Approximately 127,365 acres of land would be withdrawn, about 62,000 acres less than under Alternative I. Much of the land identified in Alternative I, particularly the land identified as range safety zone C north of B-16 and in the Dixie Valley area in the 1982 RAICUZ study, can be managed effectively under the administrative authority of the BLM with Navy review and approval. The lands identified for withdrawal under this alternative are those lands of immediate importance to the Navy training mission and intended for flexible use in support of that mission or those lands that pose a potential hazard to public safety. BLM administrative management processes are not designed to support this kind of use.

  Approximately 6,100 acres north of B-16 would be withdrawn because of practice/inert off-range ordnance and for integrated air and ground training activities. Lands east of the range would be withdrawn because of off-range ordnance and public safety. Approximately 1,500 acres in the Dixie Valley area, just north of Highway 50 and northwest of B-17, would be included. This area would provide a continuous land management link between the Dixie Valley area and B-17. Lands within the Highway 50 right-of-way are not included in the withdrawal.

  This withdrawal footprint differs from Alternative I in that a portion of the shoal site, the land west of B-16, the land west of Highway 95 near B-19, the land in the Job Peak Wilderness Study Area, and the land west of Scheelite Mine Road near B-17 would not be withdrawn. Approximately 21,000 acres north of B-16 proposed under Alternative I would not be withdrawn.

  As part of this withdrawal, a parcel of land approximately one mile wide (one section wide) will connect the major portion of the Dixie Valley withdrawal with the Navy-owned property on the north end of the valley. This panhandle will facilitate better use of withdrawn public land and Navy-owned property by permitting uninterrupted movement of ground personnel from one area to the other. Additionally, it will permit placing and moving visual cues and mobile EW sites the entire length of the valley, which will add greatly to the realism of the training scenarios created in support of all NSAWC- and CNO-sponsored training missions. The Dixie Valley area footprint provides a variety of rugged and flat terrain to simulate possible enemy environments. The acreage also would support required integrated air and ground training operations, such as rescuing downed pilots, and developing EW, TACTS, and visual cueing device sites. Alternative II includes all lands closed to the public due to the presence of off-range ordnance. This withdrawal will not include the Nevada Department of Transportation right-of-way along the Dixie Valley Road.

- *Alternative III.* Under this alternative, approximately 152,765 acres would be withdrawn. The footprint is similar to Alternative II but includes more land in the northern portion of the Dixie Valley area. It also includes the land just north of Highway 50 and northwest of B-17 and the corridor of land that connects the Dixie Valley area to Navy-owned lands in Dixie Valley.

  Alternative III allows for integrated air and ground training and operations in concert with CVW training. It allows for multiple realistic training scenarios that require the pilot to react to different combat situations. It provides adequate land for placing realistic visual cueing devices. As compared to Alternative II, the larger Dixie Valley area with the panhandle would allow for maximum combat training flexibility but would not minimize the amount of land withdrawn. All land known to contain off-range ordnance would be withdrawn.

  Alternative III differs from Alternative I in that approximately 21,000 acres north of B-16, the land west of B-16, a portion of the shoal site, the land west of Highway 95 near B-19, and the land west of Scheelite Mine Road would not be withdrawn.

- *No Action Alternative*. Under the No Action Alternative, the Navy would not withdraw any federally administered public lands around the FRTC training ranges. Navy operations would continue on existing ranges. Public lands, including those containing off-range ordnance, would remain under the authority of the current managing agencies. The No Action Alternative would be the least disruptive of the natural environment of the alternatives evaluated; therefore, it is considered the environmentally preferred alternative. However, the No Action Alternative would not be protective of the human environment, as discussed below, and would not satisfy the purpose and need of the proposed action.

  The No Action Alternative does not establish appropriate management responsibility for land containing off-range ordnance because the lands would not be under Navy control. It does not provide for the safety buffers defined through HAZARD modeling. The realism and flexibility of combat training activities would be severely limited under this alternative because visual cueing, integrated air and ground training, and close air support operations would be limited to existing Navy lands. This loss of realism would result in incomplete training of combat pilots, thereby increasing the potential for loss of lives in actual combat situations. The No Action Alternative does not meet the mission evaluation criteria (Section 2.2.1); therefore it is not a reasonable alternative for purposes of this action. It is analyzed in this report to provide a baseline of current conditions as required by CEQ regulations (40 CFR 1502.11[d]).

Four other alternatives were eliminated from detailed study because they did not fulfill one or more of the evaluation criteria (Section 2.2.3). Each alternative is presented below, along with a brief discussion on why it is not a reasonable alternative:

- *Increase the Size of the Withdrawal.* This alternative would withdraw over 200,000 acres of public land to include the widest safety buffer specified by the various studies, with the exception of land located on Walker River Indian Reservation. It is not the Navy's intent to withdraw any more public land than is required to support the purpose and need of the withdrawal. While this withdrawal would fulfill the majority of training and safety requirements, it would not minimize the disruption of other public land users. For this reason, this alternative is not considered reasonable and is not analyzed in detail.

- *RAICUZ Withdrawal.* This alternative would withdraw 181,323 acres of public land, as recommended by the 1982 RAICUZ study. The 7,750 acres of land identified as containing off-range ordnance but not included in the 1982 RAICUZ footprint would not be withdrawn. This is not a reasonable alternative because the Navy would not withdraw ordnance-contaminated lands, as requested by the BLM. The BLM would have to continue managing the 7,750 acres containing off-range ordnance but not withdrawn under this alternative. In addition, it would not withdraw the land north of Highway 50 and B-17 or link the withdrawal lands in the Dixie Valley area to the Navy's Dixie Valley land holdings. Therefore, this alternative would not provide the most efficient use of the land for integrated air and ground training.

- *Off-range Ordnance Withdrawal.* This alternative would withdraw only the 24,464 acres of public land identified during the 1989 and 1990 sweeps as containing off-range ordnance (Figure 1-5). This alternative fulfills only part of one of the evaluation criteria objectives—close public access on lands containing off-range ordnance. It does not provide the safety buffers around the FRTC training ranges defined through HAZARD modeling (Figure 1-3). These buffers, which are based on operational requirements and parameters, are necessary to contain public safety hazards.

The Off-range Ordnance Alternative would not fulfill training-related criteria and would not provide the necessary land area for the Navy to change and improve realistic operational and strategic combat training. The modern Navy uses jets equipped with complex technologies including state-of-the-art weaponry and communication, navigation, and guidance systems. To operate these jets effectively and to maximize their performance in combat situations, pilots must have intense and realistic training under simulated conditions. Visual cueing devices, TACTS sites, and EW sites simulate enemy threat scenarios, counterattacks, and complex targeting scenarios. Under the Off-range Ordnance Alternative, developing visual cueing and mobile EW sites would be allowed on existing Navy training ranges and off-range ordnance lands only. This would limit the Navy's flexibility to vary training combat scenarios and would therefore limit training capabilities at the ranges. The loss of realism in training caused by these restrictions would result in the incomplete training of combat pilots, thereby increasing the potential for loss of life in real world combat situations.

The Off-range Ordnance Alternative would not withdraw the land north of Highway 50 and B-17 or link the withdrawal lands in the Dixie Valley area to the Navy's Dixie Valley land holdings. This alternative would limit the ability of the Navy to provide effective integrated air and ground combat training. Integrated air and ground training is an increasingly important training component of the Navy and other branches of the military. Training in a variety of terrain is invaluable to this mission. Various types of lands are required for landing zones, for long-range patrols, and for simulating the terrain found in various real world scenarios.

This alternative would not give the NSAWC the flexibility to quickly respond to changing training needs because any proposed use on public lands under the authority of the BLM would have to go through BLM administrative processes. Additionally, the compatibility of land uses surrounding the ranges is an issue insofar as it affects the training missions and the viability of the FRTC.

This alternative would not provide the area and diversity required for effective training and does not meet Department of Defense safety requirements and policies. Because this alternative does not meet the above requirements, it was not carried forward for detailed analysis.

- *Relocate All or Part of the Fallon Range Training Complex.* This alternative would consist of relocating all or part of the existing ranges. The components of this alternative are: relocate the FRTC, close B-16, relocate B-16 operations to other regional ranges, and relocate B-16 operations to B-20. None of these options present reasonable alternatives to the proposed action, as discussed below.

  - Relocate the FRTC. This option would involve identifying new or available airspace and identifying or constructing facilities for aircraft and personnel. Establishing a new range that could offer the same level of combat training is not viable because of the limited availability of large amounts of airspace and land, the potential for creating new environmental impacts, and the political climate against creating new military installations. Relocating the FRTC to other regional ranges is not a reasonable option because such ranges do not have the available airspace or support facilities to accommodate the amount or type of training activities performed at the FRTC. For these reasons, this alternative was eliminated from further consideration.

  - Close B-16. It was recommended during the public scoping process that B-16 be closed and training activities be relocated to other regional ranges because of noise and safety concerns. Closing B-16 was examined and determined not to be a viable option because it does not meet the evaluation criteria for this project and it would adversely affect NAS Fallon's training mission. The strategic importance of B-16 is discussed in detail in Section 2.2.3.

  - Relocate B-16 Operations to Other Regional Ranges. Moving B-16 to other regional ranges, such as Nellis Air Force Base, does not meet the evaluation criteria and is not a reasonable alternative. Other regional ranges are in excess of 150 nautical miles from NAS Fallon, which adds transit time, increases fuel consumption, and reduces training time and quality for participating pilots. Additionally, the nature of the activities conducted at some regional ranges and their increased use as a result of BRAC consolidations will continue to reduce the availability of other regional targets. Regular use of other regional ranges, therefore, is not a viable alternative.

  - Relocate B-16 Operations to B-20. This option does not meet evaluation criteria and is not a reasonable alternative because the airspace around B-20 lies within the same training area as B-17 and B-19. B-16 has completely separate airspace from the rest of the FRTC and can be used independently of but concurrently with other ranges for basic air-to-ground training.

ENVIRONMENTAL ANALYSIS

Existing Environment

Most of the land proposed for withdrawal is managed by the BLM, with most the area north of B-16 administered by the Bureau of Reclamation and the shoal site administered by the Department of Energy. The withdrawal lands surround the existing NAS Fallon training ranges B-16, B-17, and B-19 and are primarily undeveloped except for roads and utility corridors. Withdrawal lands east and north of B-16 (practice/inert ordnance only), north, south, east, and west of B-17, and east of B-19 have been impacted by off-range ordnance and are closed to public access under a BLM emergency closure order. The Navy has developed communication sites in the proposed withdrawal area, primarily in the Dixie and Fairview Valleys.

The primary public uses on the lands proposed for withdrawal, like on much of the public land in the western US, are recreation, grazing, and mining. The areas of highest recreational value include the Sheckler Reservoir north of B-16 (included in the Alternative I footprint), the Pony Express National Historic Trail that runs adjacent to but is not included within the withdrawal area, the Job Peak Wilderness Study Area in the northern Dixie Valley area (included in the Alternatives I and III footprints), and the Stillwater and Clan Alpine Mountain Ranges.

Grazing occurs south of B-16, around B-19 to the east, north, and west, around B-17, and in the Dixie Valley area. Withdrawal lands fall within the Horse Mountain, Bass Flat, Bucky O'Neil, La Beau Flat, Clan Alpine, Frenchman Flat, and Mountain Well/La Plata grazing allotments.

Mining occurs throughout the withdrawal area. The areas of highest mineral potential are located east of B-19 in the Holy Cross District, southeast of B-17 in the Fairview District, and in the Dixie Valley area in the Wonder District.

Environmental Consequences

The primary impacts of the land withdrawal would be the denial of public access on Category A lands, and the effects to resources on Category A and B lands from integrated air and ground training and development of EW, TACTS, and visual cueing device sites. An overview of impacts to each resource category is provided below. The impacts discussed may apply to any of the three alternatives.

Geology and Soils. Potential minor impacts to soils and geology include potential erosion and soil compaction during development of EW, TACTS, and visual cueing device sites and construction and use of any new roads or utility corridors, if needed. These effects would be avoided or minimized through natural resource management techniques or through standard geotechnical engineering and design. No impacts to soil quality would occur from the continued use of chaff (Section 4.2.1).

Water Resources. The primary impact to water resources would occur on Category A lands. No new developments would be allowed, and access to the four existing developments would be closed except to BLM or the Nevada Division of Wildlife. No significant impacts to water quality are expected from the continued use of chaff. Chaff is insoluble in water, it would be filtered out before entering drinking water systems, and studies show an insignificant increase in metals content in water spiked with chaff (Section 4.2.2).

Biological Resources. No significant adverse impacts to endangered and threatened species are expected. Siting of Navy-developed facilities will avoid known sensitive species and habitats, and biological surveys will be conducted as required. Noise impacts to wildlife are not expected to be significant. To reduce startle effects, no ground or low-level helicopter training below 500 feet above ground level (AGL) will take place within a one-half mile radius of springs and water troughs. All construction and training activities would adhere to Navy policies of responsible stewardship of natural resources and to the requirements of all federal and state laws. Ground training would take place near B-17. While training is not expected to occur at Scheelite Mine Road, to avoid impacts to migrating tarantulas the Navy will not conduct ground training along Scheelite Mine Road during the migration periods. Integrated air and ground training would increase ground disturbance, potentially harming vegetation and promoting the spread of noxious weeds. The Navy will apply the Natural Resource Management Plan to withdrawn lands to control the spread of noxious weeds. Based on available data, aluminum-based chaff, such as that used at NAS Fallon, is not toxic to plants or wildlife. Development and maintenance of water storage troughs on Category A lands could be affected; the Navy and BLM have a cooperative agreement to allow BLM access to their guzzler on Category A land (Section 4.2.3).

Air Quality. Constructing EW, TACTS, and visual cueing device sites would temporarily impact air quality, especially in the generation of particulate emissions. The effects will be minimized through standard dust controls, such as watering. Integrated air and ground training, which includes helicopter hovering, would create dust impacts. This would be a localized and temporary effect. The continued use of chaff would not significantly impact air quality since chaff quantities released at one time are not great and do not break down to concentrations small enough to cause an impact (Section 4.2.4).

Noise. The land withdrawal would not in and of itself cause an increase in aircraft operations and associated noise. Constructing Navy-developed sites would result in noise of short duration. Noise from integrated air and ground training could result in disturbance to public land users in close proximity to operating helicopters. Most training occurs during the week and half of the training occurs at night, reducing the potential for training to occur during other uses of the land. In addition, it is standard operating procedure to avoid training near other public land users (Section 4.2.5).

Visual Resources. Navy activities, including site development and integrated air and ground training, would be visible to other users of public lands. The visual impacts of site development would be reduced by using colors that blend with the background. Fencing around Category A lands would be visible to travelers on nearby roadways; however, fencing is common throughout the region. The lands to be withdrawn are not to be used as target areas and there is no increase proposed to weapons impact areas. Long-term use of chaff could result in visible aluminum litter, but because of its wide dispersion pattern, it is not expected that chaff would alter the regional viewshed (Section 4.2.6).

Cultural Resources. The Carson Desert Predictive Model is one tool that will be used to delineate areas potentially containing surface and subsurface resources. These areas would be avoided in siting facilities. Site-specific surveys would be conducted as needed. The Navy will comply with the National Historic Preservation Act and with the procedures outlined in the NAS Fallon Cultural Resource Management Plan and Programmatic Agreement. Ground training exercises will not significantly affect cultural resources. Ground vehicles will use existing trails and roadways, and foot traffic will be dispersed over a wide area. Officers in charge of ground training operations will be provided information to assist them to avoid damage to culturally valuable areas (Section 4.2.7).

Land Use. The proposed land withdrawals will eliminate access to Category A lands and will limit the height of structures on Category B lands to 50 feet. The Navy will consider waiver of the height limit in cases where structures exceeding 50 feet are proposed for short-term development. Waivers must not pose a safety hazard to aircrews. Permanent nonconforming structures may be allowed in some areas if such structures are compatible with Navy training operations and do not pose a safety hazard. The land withdrawal will not place jurisdictional constraints on Churchill County or the City of Fallon (Section 4.2.8).

Environmental Justice and Socioeconomics. The proposed land withdrawal will not have disproportionately high and adverse human health or environmental effects on minority or low income populations. Lands belonging to the

Walker River Paiute Tribe and the Paiute-Shoshone Tribe of the Fallon Reservation and Colony are in close proximity to the withdrawal area. However, Native American groups do not use the proposed withdrawal lands for grazing, mining, or recreation in a higher proportion than other segments of the population. Socioeconomic impacts resulting from the closure of Category A lands could occur (Section 4.2.9).

Mineral Resources. The most significant impacts to mining would occur on Category A lands where mining activities would be closed to protect public safety. The Navy will explore means to compensate holders of patented or valid unpatented mining claims, subject to Congressional authorization and appropriation. The loss of revenue from undeveloped resources is an unmitigable impact. Potentially significant impacts to mining on Category B lands could occur in that no patenting of unpatented claims would be allowed after withdrawal. There are no areas of high mineral potential on Category B lands except in the Wonder District located in the Dixie Valley area. Only a small portion of the Wonder District falls within the preferred alternative withdrawal boundary. Applications for BLM permits for mining on Category B lands would require Navy review and approval. Approval would be granted where development was compatible with Navy training operations (Section 4.2.10).

Livestock Grazing. No livestock grazing would be permitted on Category A lands. A maximum of 1,130 animal unit months (AUMs) could be affected, or 1.4 percent of the 80,000 AUMs in the Lahontan Resource Management Area. The Navy will explore means of compensating holders of affected grazing permits, pursuant to the Taylor Grazing Act and subject to Congressional authorization and appropriation. Lost grazing opportunities on Category A lands are an unmitigable impact. Grazing would not be permitted on fenced Navy-developed sites, but this would not be a significant impact because of the small acreage that would be affected. The proposed land withdrawal would not significantly impact grazing or wild horse management on Category B lands. However, to minimize startling cattle and wild horses, the Navy will not conduct ground training or low-level flights below 500 feet AGL within a one-half mile radius of all springs and water troughs. Applications for BLM permits for grazing on Category B lands would require Navy review and approval. Approval would be granted if development was compatible with Navy training operations. Based on available data, the continued use of chaff will not adversely affect livestock (Section 4.2.11).

Recreation and Public Access. The greatest impacts to recreation would occur on Category A lands where access would be denied. While lost recreational activity on these lands is not mitigable, recreational opportunities would still be available on other lands in the area. Potentially significant impacts to recreation also could occur from Navy activities on Category B lands. The presence of these activities could alter the social character of the area, and may discourage use of the lands for recreation even though recreation itself would not be restricted. The Navy will make every effort to avoid the public during ground training activities and will provide education program materials on Navy training activities on Category B lands to the BLM, NDOW, and BUREC for public distribution. Applications for BLM permits for recreation on Category B lands will require Navy review and approval. Approval will be granted if the proposed recreational use is compatible with Navy training operations. The Pony Express National Historic Trail or American Discovery Trail will not be impacted. The trail is not on lands proposed to be withdrawn, and access on the trail would not be restricted If there is an organized annual re-enactment of the Pony Express Trail ride, the Navy will work with trail personnel to alter flight activities during the event if compatible with training needs at the given time (Section 4.2.12).

Public Health and Safety. The proposed land withdrawal will benefit the public health and safety by improving the public protection from potential and existing off-range ordnance. The operation of Electronic Warfare sites presents no hazards. The levels of electromagnetic radiation associated with the sites are low. The sites are fenced, and lights indicate when the site is operational. The use of chaff will not significantly impact public health and safety. No study was found that indicated that materials in chaff are known to pose a health risk. Studies indicate that the materials pass through the systems of species that ingest them; that chaff doesn't break down into particles small enough to create an inhalation risk, and that the chaff used does not cause allergic contact dermititis (Section 4.2.13).

Transportation. The proposed land withdrawal would not affect any major highway in the region. Local roads historically used to access mining areas would be located in Category A-designated lands. These roads are closed under the BLM emergency closure action and would continue to be closed to public use. While alternative routes may be identified, the loss of an existing road is an unmitigable impact. No increase in local traffic, including on Dixie Valley Road, is expected from the withdrawal (Section 4.2.14).

Airspace Designation and Use. As with current practices, chaff use at B-17 and the Dixie Valley area could affect air traffic control radar. However, any major chaff release will continue to be coordinated with the appropriate FAA facilities, as is standard operating procedure (Section 4.2.15).

Cumulative Impacts

The FEIS evaluates the cumulative effects of DOD use of existing, proposed, and reasonably foreseeable land withdrawals and airspace designations in the region.

Water Resources. It is likely that land-disturbing activities on the withdrawn lands may have increased sedimentation in some of the surface water resources. There is no indication that significant impacts to surface water resources have occurred as a result of land withdrawals and subsequent military use. Ground water resources within withdrawn lands are not expected to be significantly affected by continued military and DOE activities. Most withdrawn lands restrict access for the development of water sources. As the population of Nevada continues to expand and the demand for water increases, these restrictions may hinder growth opportunities.

Biological Resources. Habitat conditions on DOD withdrawn lands have been affected by construction and military activities, including the delivery of explosives ordnance, and from noise due to aircraft overflights and ordnance detonation. Continued use of the withdrawn lands would further degrade habitat conditions near impact areas. The habitat quality at these areas, however, is already low due to past use. The proposed change in flight patterns at B-16 would reduce noise levels near Sheckler Reservoir, thereby benefiting bald eagle habitat and waterfowl. The new flight pattern would result in increased noise levels immediately south of B-16. No sensitive species are known to exist in this area and no significant impacts are expected. Reasonably foreseeable airspace designations potentially would enlarge the area that would be affected by overflights, although there would be no increase in the number of flights. Wildlife in these areas could be subject to some startle effects, but studies of effects from existing flight activities suggest that they would not be significant

Land Use. Lands withdrawn in Nevada for defense-related purposes could contain deposits of gold, molybdenum, tungsten, lead, zinc, copper, and silver, numerous small deposits of base and precious metals, and commercially viable geothermal reservoirs. Most of the defense-related withdrawals are deemed either unfavorable or marginally favorable for oil and gas. Virtually all of these lands contain some form of industrial minerals and materials. Defense-related land withdrawals in Nevada have excluded, and would continue to exclude, mining, petroleum, and geothermal industries from approximately six percent of the total acreage in Nevada that otherwise would be available for exploration and development. Military and DOE withdrawals have restricted some lands from potential livestock grazing and agricultural opportunities. While this has and will result in lost revenue from grazing and agriculture, indirect growth in the private sector in support of military facilities likely exceeds that lost from grazing and agriculture. The Special Nevada Report (SAIC 1991) describes in detail the suitability of withdrawn lands in Nevada for recreational activities. This analysis determined that most withdrawn lands could support the same recreational activities that are performed on other undeveloped arid lands of the Great Basin and Mojave Deserts, including camping, hunting, hiking, off-road vehicle (ORV) use, horseback riding, and rock hounding (SAIC 1991). While public access is generally restricted on most DOD and DOE withdrawn lands, these areas (and proposed withdrawal lands) do not contain recreational opportunities that cannot be found on nearby public lands.

Environmental Justice and Socioeconomics. Defense-related activities on withdrawn lands in Nevada are projected to contribute $2,027,000 to the state Gross Regional Product by 2000 and to employ approximately 22,000 people (SAIC 1991). This represents approximately four percent of the total state Gross Regional Product and over two percent of total state employment. The primary economic trade-off of DOD and DOE use is the land use restrictions placed on withdrawn lands, which prevent or limit agriculture, grazing, mining, and recreation. The economic value of these foregone opportunities is minimal and would not exceed current contributions to the state economy from the DOD and DOE. All populations would continue to be equally impacted by defense operations; therefore, no disproportionately high or adverse effects are expected to minority or low-income communities. Airspace designations are not expected to have any socioeconomic impact or result in disproportionately high and adverse human health or environmental effects on minority or low-income populations.

Visual Resources. Most withdrawn lands used by the military and DOE are remote and similar in topography and scenic quality with surrounding lands. Land-disturbing activities, such as ordnance detonation, have affected the visual qualities by creating unnatural features, including structures and craters. Continued use of these areas may culminate in additional alterations to the viewshed. These effects, however, would not be significant because of the homogeneity within viewsheds and because there are few sensitive receptors, such as highways, homes, and high-use recreation areas, near the withdrawn lands. Impacts from proposed airspace actions are not expected to impact visual resources.

Cultural Resources. Defense-related activities have impacted the cultural resources located on withdrawn lands in Nevada (SAIC 1991). The Air Force, Navy, Army, and DOE have adopted or are developing cultural resource management plans to minimize future impacts. Inadvertent losses still may occur from military uses; however, significant historical and archeological resources on withdrawn lands are not expected to be impacted. No impacts are anticipated to cultural resources from realignment of airspace at B-16. Project specific studies would be required to assess impacts from proposed airspace actions that involve low-level flights.

Noise. Noise associated with withdrawn lands results from aircraft overflights, helicopter operations, ground-based training, including vehicle operations, and live ordnance explosions. All withdrawn lands are remote and removed from sensitive noise receptors. As populations increase around DOD facilities, the potential for noise complaints may increase. Fallon has adopted land use and building codes to try to reduce such incompatible land uses. Noise levels from the proposed realignment of airspace over B-16 would benefit residents near Sheckler Reservoir and not have any significant impacts. The reasonably foreseeable airspace designations would have the potential to affect noise levels from low level flights.

Public Health and Safety. Current military activities do not cause unreasonable risks to the health, safety, or property of the citizens of Nevada (SAIC 1991). Although military activities have introduced an element of risk to the public in the region, existing and proposed safety procedures, buffers, and training restrictions at the facilities and the ranges have reduced or would reduce the potential magnitude of risk to an acceptable level. The proposed NAS Fallon land withdrawal would make inaccessible to the public those areas that have been affected by ordnance in the past or that potentially could be affected in the future. The continued use of chaff is not thought to adversely impact public health, though the General Accounting Office currently is studying the effects of chaff use on the human and natural environment. The addition of new airspace could result in risks from aircraft mishaps in previously unaffected areas.

Transportation. Cumulatively, the land withdrawals and airspace designations would not significantly affect ground transportation. No major roads would be closed, and only minor roads would be affected.

Airspace Designation and Use. The military airspace designations have the potential to change civil aviation in the FRTC. Creating new MOAs and restricted areas could place additional restrictions on civil aircraft, but these would be balanced partially by disestablishing portions of other MOAs and restricted areas.

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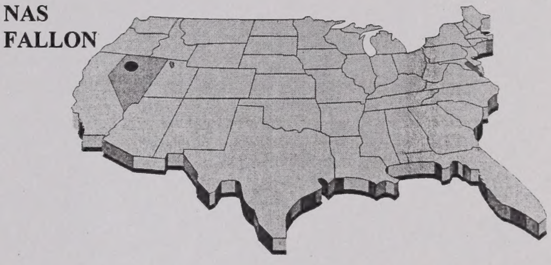

1.0 PURPOSE OF AND NEED FOR ACTION

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1. PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

This final environmental impact statement (FEIS) evaluates the potential impacts to the environment that may result from the withdrawal of federally administered public land adjacent to training ranges at Naval Air Station (NAS) Fallon, Nevada. The withdrawal will not cause an increase in total air operations or increase the size of the impact areas within the ranges, but is designed to improve the realistic operational and strategic combat training at Fallon and to increase control and management of safety buffers and areas where off-range ordnance has been found.

The purpose of the proposed action is to provide the necessary land area for the Navy to maintain and improve realistic operational and strategic combat training and to provide safety buffer zones around existing training ranges, including lands containing off-range ordnance. The need for the proposed action results from changes in military technology and strategy since establishing NAS Fallon and the Fallon Range Training Complex (FRTC) and from the Navy's responsibility to protect the public from safety hazards. Sections 1.2 and 1.3 discuss the purpose and need of the proposed action in detail.

The Navy would manage the withdrawn public lands in conjunction with the Bureau of Land Management (BLM), Bureau of Reclamation (BUREC), and Department of Energy (DOE) primarily for military purposes, subject to existing valid rights, for a proposed term of 25 years. Land use categories are proposed for the withdrawn public lands to allow continued multiple uses on lands where it is safe for such activities and, where appropriate, to restrict use because of safety hazards. The Navy developed a resource management plan, included as Appendix J, in consultation with the BLM, BUREC, and DOE. The resource management plan will be submitted to BLM for final approval after the Navy issues its Record of Decision (ROD).

The process for pursuing the Range Safety and Training Land Withdrawal, an action previously referred to as the "Master Land Withdrawal," would be done in conformance with the Federal Land Policy and Management Act of 1976 (FLPMA) and the Engle Act of 1958 (PL 85-337). Under this action, jurisdiction (at least in part) of withdrawn lands would be transferred from the Department of the Interior to the Department of the Navy. The withdrawal will require congressional authorization, pursuant to the Engle Act.

As required by the Base Realignment and Closure (BRAC) decisions of 1993, the Naval Fighter Weapons Schools (TOPGUN) and Carrier

Airborne Early Warning Weapons Schools (Top Dome) relocated to NAS Fallon from NAS Miramar, California, in 1996.

The land withdrawal originally was proposed in 1982 as the Master Land Withdrawal. In 1984, a draft environmental impact statement (DEIS) for the Master Land Withdrawal was prepared but was not finalized. Information from the 1984 DEIS, along with new and updated information, has been incorporated into this document. Appendix A provides a detailed history of the land withdrawal proposal.

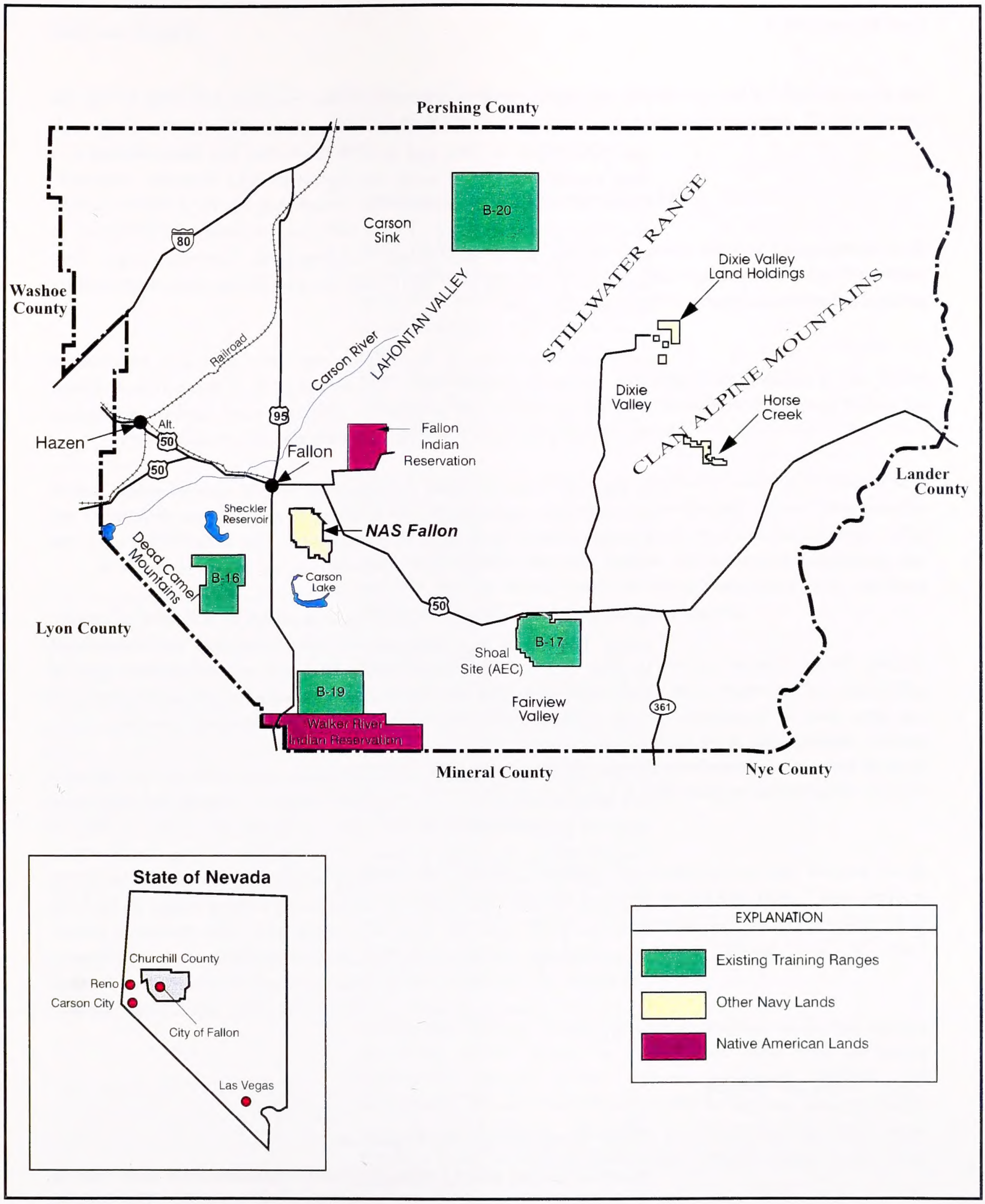
This FEIS has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations on implementing NEPA (40 CFR 1500-1508), and Navy guidelines (OPNAVINST 5090.1B). The Navy is the lead agency for the withdrawal action, with the BLM acting as a cooperating agency. Cooperating agencies have jurisdiction by law or special expertise with respect to certain environmental impacts from a proposed action by another agency. The role of a cooperating agency does not imply concurrence with the proposed action.

This chapter provides a brief overview of NAS Fallon and the training ranges, explains the purpose and need for the land withdrawal, and reviews issues and concerns raised during public scoping. Chapter 2 presents the alternative selection criteria, describes the proposed alternatives in detail, analyzes the degree to which each alternative fulfills the selection criteria, and provides land use classification and reasonably foreseeable military activities that would take place on the withdrawn lands. Chapter 3 presents the existing conditions (baseline data) for the area that would be affected by the withdrawal; Chapter 4 analyzes potential environmental impacts of each alternative; and Chapter 5 evaluates the cumulative effects of this proposal combined with other future military land withdrawals.

1.2 HISTORY AND MISSION OF NAS FALLON

1.2.1 History of NAS Fallon

NAS Fallon is in the Lahontan Valley of Churchill County in west-central Nevada, approximately 70 miles east of Reno and six miles southeast of the City of Fallon. The Dead Camel Mountains and Sheckler Reservoir are west of NAS Fallon, and the Carson River lies to the northwest. The Walker River Indian Reservation is south of NAS Fallon, and the Fallon Paiute-Shoshone Indian Reservation and Stillwater National Wildlife Refuge are northeast of NAS Fallon. The Stillwater Mountain Range is east and Carson Lake is south of NAS Fallon (Figure 1-1).



NAS Fallon is located in Churchill County, Nevada. In addition to the air station, the Navy administers four training ranges and owns lands in the Dixie Valley. The Walker River Indian Reservation extends into Mineral and Lyon Counties.

Source: Tetra Tech

Location of NAS Fallon and the FRTC

NAS Fallon, Nevada

Figure 1-1

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The original facilities at NAS Fallon were established in 1942 by the US Army Air Corps for inland defense during World War II. The Navy took over NAS Fallon in 1943, and in 1944 the facility was commissioned as a naval auxiliary air station under the control of NAS Alameda, California. Under the National Emergency War Powers Act, the NAS Fallon training range was created in April of 1944 with the temporary establishment of Bravo-20 (B-20), a high impact air-to-ground bombing range. Two additional ranges, Bravo-17 (B-17) and Bravo-19 (B-19), were established by use permit in 1945.

Following World War II, NAS Fallon was deactivated to a maintenance level, placed in caretaker status, and turned over to the Bureau of Indian Affairs. The airstrip was reopened in 1951 as a naval auxiliary air station, and in 1953 B-16, B-17, and B-19 lands were transferred to the Navy.

In 1942, the Navy withdrew approximately 623,000 acres of public land to establish the Black Rock Desert Bombing Range, but the withdrawal was revoked in 1943. The range was reestablished in 1944 with 700,000 acres, was reduced in 1949 to 272,000 acres, and was returned in 1963 to the BLM.

In 1944, the Navy withdrew 800,000 acres to establish the Sahwave Gunnery Range. These lands were relinquished in 1946. The range was reestablished in 1958, with 519,000 acres of public land, and was relinquished again in 1965. Black Rock and Sahwave Ranges both were located approximately 50 miles northwest of NAS Fallon in Humboldt and Pershing counties.

In 1972, NAS Fallon was reclassified as a major command and was upgraded to a naval air station with the primary mission of training and supporting naval air groups. NAS Fallon formally established the FRTC in 1977 to provide airspace and range facilities for air warfare training. Lands within B-20 were withdrawn in 1986, formally establishing the range. The FRTC currently includes four geographically separate training ranges (B-16, B-17, B-19, and B-20), three air traffic control gap filler radar stations, a tactical aircrew combat training system (TACTS), an electronic warfare (EW) area, and special use airspace. All of the training ranges originally were designed for the performance and tactics of World War II-era and Korean Conflict-era aircraft.

1.2.2 Naval Air Training

1.2.2.1 Naval Air Training Continuum

Naval air training at NAS Fallon follows a continuum from basic training to increasing levels of training complexity and intensity. The training continuum starts with basic flight training and continues with fleet replacement squadron (FRS) training, unit level training, typewing weapon school training, integrated airwing training, ship and battlegroup workups, and ends with deployment. NAS Fallon follows the axiom, "Train like you fight."

The components of training are described below:

- *Basic Flight Training*. This is the initial training administered to all naval aviators from the first day of flight training to the day the aviator earns his or her wings. This basic flight training is conducted in training aircraft and occurs over one to two years.

- *Fleet Replacement Squadron Training*. FRS training is the initial training in fleet aircraft and takes five to eight months. NAS Fallon has two permanent F/A-18 FRS detachments.

- *Unit Level Training*. This is the day-to-day training performed in a deployed squadron. It emphasizes single aircraft, section (two aircraft), and division (four aircraft) events. Unit level training achieves initial basic qualifications for new aircrew and maintains proficiency for aircrews that are already qualified. Most West Coast units use NAS Fallon and the FRTC for their unit level training.

- *Typewing Weapon School*. The typewing weapon school offers a structured syllabus administered by each typewing to standardize squadron unit level training. At the completion of unit level and typewing training, aircrews are familiar with their aircraft, aircraft weapons and weapon systems, and single aircraft, section, and division tactics. Navy F/A-18, F-14, and EA-6B weapon schools train at NAS Fallon training ranges.

- *Integrated Airwing Training*. The integrated airwing training brings squadrons together to train as a team for the first time. Teams perform integrated airwing strikes. All airwing aircraft types meld their capabilities together to form a coherent fighting force. All Navy airwings train at NAS Fallon and the FRTC.

- *Battlegroup Workups*. During battlegroup workups an airwing deploys aboard an aircraft carrier to operate and train with an entire battlegroup (aircraft carrier, cruisers, destroyers, frigates, and submarines). The unit level training to the battlegroup training usually takes six to 18 months, depending on the battlegroup deployment schedule. Navy airwings conduct strikes from the carrier to the NAS Fallon ranges.

Because the FRTC is capable of providing all levels of naval air training and because it is the only range with airspace, targets, threats, and instrumentation capable of accommodating an entire carrier airwing, the FRTC is the Navy's best training range.

1.2.2.2 Training Mission at NAS Fallon

The mission of NAS Fallon is to provide facilities (including training ranges), services and materials to tenants and transient units stationed at or being deployed to NAS Fallon for Chief of Naval Operations (CNO) approved aviation training. The Naval Strike and Air Warfare Center (NSAWC) is the major tenant command. NSAWC develops realistic combat training scenarios for military aircrews flying high-performance jet aircraft and helicopters, employing state-of-the-art military equipment and tactics. NSAWC operates, maintains, schedules, develops, and configures the FRTC. The Commanding Officer (CO) of NAS Fallon is assigned an additional duty (ADDU) relationship, subordinate to the Commander of the NSAWC. The NAS Fallon training mission includes, but is not limited to, the regimens presented below.

Carrier Air Wing (CVW) Training. NAS Fallon is the only Navy facility that can support, train, and house an entire CVW for initial and refresher integrated strike training. A CVW consists of all aircraft, pilots, crew, and aircraft maintenance personnel assigned to an aircraft carrier. A typical CVW consists of 75 to 90 aircraft and an aircrew of between 1,500 and 2,000 personnel. NAS Fallon hosts four to six CVWs and up to two Marine airwings per year for an intensive four-week training program prior to their scheduled deployment aboard aircraft carriers or to air stations overseas (US Navy 1995e). This integrated training focuses on combat tactics and team building by allowing aircrews to perform realistic combat warfare techniques, including air-to-air and air-to-ground combat scenarios. In addition, NAS Fallon provides integrated ground personnel and air support scenarios.

The CVW training predominately takes place at B-17, B-19, and B-20 and uses "commodore" airspace. Commodore airspace consists of all restricted airspace and military operation area airspace within the FRTC, except for the restricted airspace over B-16.

Fleet Replacement Squadron Training. In addition to CVWs, NAS Fallon hosts an FRS detachment. The FRS detachment is based permanently at NAS Fallon and operates a maintenance facility for F/A-18s from NAS Lemoore, California, and NAS Cecil Field, Florida, the respective West Coast and East Coast Hornet FRSs (US Navy 1995e). A typical FRS detachment consists of 12 aircraft. FRS training occurs at all of the ranges, except when a CVW is training; during these times FRS training takes place at B-16.

TOPGUN Training. TOPGUN conducts a syllabus focusing on air-to-air combat and air-to-ground strike training. This program trains aircrews to defeat enemy aircraft through advanced offensive and defensive tactics. The TOPGUN training syllabus has been renamed and incorporated in the NSAWC program. The number of flights and program objectives remains the same.

Integrated Air and Ground Training. In addition to aircraft training, the NSAWC Fallon mission supports integrated ground and aircraft training, such as combat search and rescue training. Close air support operations train pilots to assist ground units by firing on enemy ground or air units. Combat search and rescue consists of integrated training with ground personnel and helicopter and fixed wing air support. The objective of the training is rescuing and transporting ground personnel, such as downed pilots, within enemy territory. NAS Fallon is the only Navy facility where the combat search and rescue mission is conducted. Ground units learn how to mark targets for aircraft and how to neutralize enemy positions, including radar sites, surface-to-air missile sites, and early warning devices. This combat search and rescue scenario generally consists of three to six personnel training with an additional three to six person "opposition" team. Pilots learn how to transport personnel and how to perform reconnaissance for ground personnel. More than 90 percent of the integrated air and ground training takes place during the week, and approximately 50 percent of the training occurs at night. Realistic integrated air and ground training is critical to the successful performance of FRSs and the deployment of CVWs. Ground training at NAS Fallon occurs as a component of the integrated air and ground training mission; it is not a stand-alone mission.

1.2.2.3 Training Facilities and Capabilities

The Aircraft Intermediate Maintenance Department, NSAWC, and the NSAWC Range Department are unique and vital institutions for training operations at NAS Fallon. The mission of the Aircraft Intermediate Maintenance Department is to provide maintenance support for Navy aircraft deployed to NAS Fallon. No other DOD facilities in the region, including Nellis Air Force Base (AFB), have the ability to maintain the various types of Navy aircraft.

The Naval Strike Warfare Center, termed Strike, was established in 1984 to conduct integrated combat strike warfare training. Strike is tasked to improve and maintain at the highest level aviation overland strike and war-at-sea tactical development and to provide training for all warfare areas (US Navy 1995e). Strike provides operational training support and academic training and oversees CVW training. The NSAWC, as of July 11, 1996, was formed as a new command and has assumed the combined functions and missions of the Naval Strike Warfare Center, TOPGUN, Top Dome, and the NAS Fallon Range Department.

The Range Department operates the four training ranges (B-16, B-17, B-19, and B-20), the EW system, the weapons impact scoring system (WISS), and the TACTS system.

The EW system simulates enemy radar detection systems and radar missile sites, thereby creating a simulated warfare threat environment.

WISS is a visual system that scores the impacts of ordnance on all targets in day and night conditions. The system uses a series of video cameras that can be trained on the various targets. The cameras are controlled remotely from the Range Operations Center at NAS Fallon.

TACTS is a computer system that allows pilots to train in realistic air-to-air and air-to-ground situations without firing air-to-air or air-to-ground ordnance. It also provides a safety margin for pilot operation on the ranges. While TACTS is a valuable training tool, it cannot substitute for air-to-ground ordnance delivery training. Training that involves transporting and delivering live ordnance provides real training on how an aircraft will function and respond during combat conditions. Live ordnance training also provides the most realistic conditions, allowing pilots to conduct laser-weapon delivery and to visually assess delivery accuracy, as well as providing hands-on training to carrier ordnance crews in live ordnance assembly. Practice/inert ordnance does not provide the full spectrum of these benefits. All training conducted on the ranges is scheduled and coordinated through the Range Department.

The most important components of the NAS Fallon operational training capabilities are the training ranges. Following is an overview of current operations conducted at each training range. Note that combat training operations at the ranges have changed dramatically since their establishment.

- *B-16 Range*: The B-16 range is in the southwestern portion of the Carson Desert, east of the Dead Camel Mountains and approximately nine miles southwest of NAS Fallon (Figure 1-1). The range was established in 1953 when Public Land Order (PLO) 898 authorized the indefinite withdrawal of 17,820 acres to support the Navy training mission. The closest of the four training ranges to NAS Fallon, B-16 allows for minimal travel time, thereby maximizing training time. The range is also the only training area in the FRTC independent of commodore airspace. This provides exclusive airspace away from other military operations.

Most of the basic and intermediate training is conducted at B-16. The range is used for basic and intermediate air-to-ground conventional bombing and for rockets using only practice/inert ordnance. Electronic scoring is available with WISS. The range contains two bull's-eyes and three spotting towers. The approach to the target is from the north with a southern egress. During CVW training, B-16 is the only range available for FRS and visiting squadron training. The Air Force and Marine Corps regularly send aircraft to train at B-16.

Twelve low-level military training routes (MTRs), which accommodate single aircraft and special strike requirements, used to terminate at B-16 (US Navy 1995d). The Navy realigned these 12 MTRs to terminate at B-20, which resulted in reduced noise levels around B-16. Ingress into B-16 for tactical training will be via the restricted airspace above and within the approach of B-16 (identified as R-4803 N/S).

- *B-17 Range*: The B-17 range is in central Fairview Valley, approximately 35 miles southeast of NAS Fallon (Figure 1-1). Consisting of 21,400 acres, the range was established by permit in 1945 and was indefinitely withdrawn in 1953 for Navy use. The range is adjacent to the Dixie Valley area and in the center of the NAS Fallon Dixie Valley threat environment. Like the Dixie Valley area, the target contains some threat emitters, and in conjunction with the Dixie Valley area, provides a realistic electronic threat environment for aircraft approaching the target for weapon delivery. For example, planes can fly through an EW environment under simulated ground-to-air missile attack conditions prior to ordnance delivery on B-17. The range is used for strafing, practice/inert and explosive air-to-ground ordnance delivery training, no-drop bomb scoring, close air support artillery spotting, mortar, small arms, and rocket delivery. Live ordnance is dropped on the east target area. The range also has simulated surface-to-air missile firing and provides for laser ranging and targeting (US Navy 1982b). Targets are marked with a laser beam from the ground or another aircraft. Ordnance with a guidance system that follows the point illuminated by the laser is fired. Chaff, a material that jams enemy radar, and flares are dispensed over B-17 and the Dixie and Fairview Valleys by overflying aircraft (Science Engineering Associates 1989; SAIC 1991, 1994; Naval Research Laboratory 1995). The WISS at the bull's-eye provides electronic bomb scoring.

Contained within B-17 are one strafing banner, one bull's-eye, a high-explosive target impact area for ordnance up to 1,000 pounds, two staffed EW radar sites, three spotting towers, and mock tactical target sites, including mock enemy tanks, a mock runway, an army compound, mock aircraft, and simulated industrial building complexes. Some targets are moved to enhance realism and to accommodate training strategies. Remote controlled moving target vehicles, such as mock tanks or missile launchers, are used for targeting but not for ordnance delivery.

- ***B-19 Range***: The B-19 range is west of the Blow Sand Mountains and 15 miles south of NAS Fallon (Figure 1-1). Consisting of 17,332 acres, the range was established by permit in 1945 and was indefinitely withdrawn for Navy use in 1953. The range is used for strafing, laser ranging and targeting, close air support, mortar, small arms, artillery spotting, and practice/inert and live air-to-ground ordnance delivery training using bombs and rockets. The range also has facilities to support simulated surface-to-air missile firing. Electronic bull's-eye scoring is available with the WISS. A strafing banner, a conventional bull's-eye, a high explosive impact area, and three spotting towers are contained within B-19. The run-in lines for the range run west to east for most operations and occasionally run from east to west. Live ordnance, up to 1,000 pounds, is dropped on the high explosive impact target area. The southern border of the range is adjacent to the Walker River Indian Reservation.

- ***Shoal Site***: The 7,405-acre shoal site consists of public land in the northern part of the Sand Springs Mountain Range, approximately 30 miles southeast of NAS Fallon and two miles west of B-17 (Figure 1-1). The plot is under the jurisdiction of the BLM, and the central portion of the site is withdrawn by the DOE. The DOE site is approximately four square miles in size and was used in 1963 to study seismic waves produced by underground nuclear explosions. Deactivation of the site began in 1964. A preliminary site assessment conducted in 1988 gave the site a Hazard Ranking System score of 3.52. This score is below the minimum score required for listing on the National Priorities List under Superfund. The DOE is currently characterizing and finishing remediation of surface areas so the site may be suitable for unrestricted public use. Access to the deep subsurface will remain excluded (DOE 1996). After nuclear testing stopped, the site was used historically by the Navy for simulated combat search and rescue training, integrated with helicopter support. DOE approval is required for subsurface disturbances in the shoal site. The Navy's use has been and would continue to be surface based.

  The north and south portions of the shoal site were used by the Navy under a BLM special land use permit obtained in 1965, prior to the enactment of FLPMA in 1976. The Navy's use of the central portion of the shoal site was established in 1966 via a memorandum of understanding (MOU) with the Atomic Energy Commission (now part of the DOE). Navy use of the site terminated with the expiration of the BLM special land use permit and MOU. The shoal site is not equipped with targets, and ordnance is not expended there.

- *Dixie Valley Area*: The portion of Dixie Valley affected by this action begins approximately 35 miles east of NAS Fallon and north of US Highway 50 (Figure 1-1). While the Navy does not have jurisdiction over the land in the Dixie Valley area, it maintains BLM rights-of-way (ROW) permits for 16 one- to seven-acre EW emitter sites and a central command center, termed "centroid," in the Dixie Valley area. These sites include associated powerlines, access roads, and communication cables.

  Aircraft within the Dixie Valley area perform electronic jamming, chaff and decoy flare dispersion, and suppression defensive maneuvers to avoid detection by simulated radar and missile sites prior to entering B-17. No ordnance is authorized to be dropped on the Dixie Valley area. The Dixie Valley area has associated special use airspace that allows for flights as low as 200 feet above ground level. This allows pilots to perform realistic low-level flights over varying terrain to avoid electronic detection prior to ordnance delivery at B-17. The majority of the advanced strategic combat training is conducted at the Dixie Valley area and B-17 range, making them the most intensively used areas in the FRTC.

- *B-20 Range*: The B-20 range is in the Carson Sink, approximately 17 miles east of Highway 95 and seven miles north of the Stillwater Wildlife Management Area (Figure 1-1). Although B-20 is not directly affected by the land withdrawal, it is critical to the FRTC and training operations within commodore airspace. The proposed land withdrawal would not withdraw any public land at B-20.

  The range has been operational since the early 1940s and is composed of 41,007 acres of withdrawn and acquired lands. Of the total acreage, approximately 19,430 acres were acquired by condemnation from the Southern Pacific Land Company. The remaining 21,577 acres were withdrawn in 1986 by the Military Lands Withdrawal Act (PL 99-606) for 15 years and are subject to renewal.

  The B-20 range is used for air-to-ground bombing, strafing, and laser targeting. The range contains one mock submarine, two strafing banners, two bull's-eyes, one laser bull's-eye target, one lighted helicopter pad, run-in lighting, two spotting towers, and electronic scoring with the WISS. The range provides a high explosive impact target area for high explosive ordnance up to 2,000 pounds and practice/inert bombs.

1.3 PURPOSE

The purpose of the proposed action is twofold:

(1) Provide the necessary land area so the Navy can change and maintain realistic operational and strategic combat training at NAS Fallon; and

(2) Provide safety buffer zones around the training ranges, including Navy control of lands containing off-range ordnance.

1.4 NEED

1.4.1 Introduction

NAS Fallon provides critical training for Navy pilots and aircrews. Changes in technology and military strategy require that NAS Fallon change and improve its realistic operational and strategic combat training. In order to achieve the most realistic combat training possible, NAS Fallon needs to create representative threat scenarios, to provide target location and identification training and accurate tracking, and to replay training events for users of the FRTC. To accomplish this, NAS Fallon must place visual cueing devices on the FRTC and install additional electronic warfare sites and TIS units supporting the TACTS. Such conditions require large corridors of land with varying terrain. Within its training mission, NAS Fallon also must protect the public from operational hazards. As discussed below, the Navy has conducted a number of studies to define safety footprints.

This section discusses in detail the needs for the land withdrawal. The section is presented in two parts, the first of which addresses the operational need for the withdrawal and the second of which presents the need for a public safety buffer.

1.4.2 Realistic Operational and Strategic Combat Training

The mission of NAS Fallon is to train and support Department of the Navy and DOD activities. The Navy needs the public land withdrawal to maintain and improve its training function. The availability of airspace over a sparsely populated area and the proximity of the targets to the air station make NAS Fallon an ideal, highly cost-effective training facility that must be maintained. In order to retain current training capability and to meet new training requirements resulting from changes in technology, this public land withdrawal initiative is critical to the Navy's training mission.

- *Changes in Military Technology and Training Operations:* Military technology has changed dramatically since the training ranges at NAS Fallon were established. The modern Navy uses high-speed jets equipped with state-of-the-art weaponry and communication, navigation, and guidance systems. These jets can achieve high speeds and accurately target enemy installations. However, to be effective and to maximize their performance in combat situations, pilots must have intense and realistic training. Today's pilots face a variety of threats, including heat-seeking, radar-guided surface-to-air missiles and enemy aircraft. These threats require pilots to engage in countermeasures to avoid enemy detection and attack. Examples of such measures include dispersing chaff to interfere with enemy radar, releasing flares to decoy surface-to-air or air-to-air missiles, and executing low evasive flight patterns over varying terrain to avoid radar detection. Ordnance delivery often must be conducted at high speeds and at varying altitudes. Pilots also must be trained to engage in close air-to-air combat with enemy aircraft equipped with similar technology. A pilot's actions and reactions must be second nature under combat conditions. The only way to achieve such skills is extensive training under representative threat conditions. This is the objective of the training ranges.

  Unlike the visual-only ordnance delivery techniques of World War II, modern tactics rely on complex technology. There are three procedures used for conventional combat targeting. First the pilot must identify an object in the terrain, for example a military vehicle or building. This can be done with or without radar or infrared assistance. The pilot then must mark and lock onto the specific target, using lasers and radar technology. Lastly the pilot must arm and fire the weapon.

  To be effective, training operations must simulate enemy threat environments, counterattacks, and complex targeting scenarios. The mission of NSAWC at NAS Fallon and the incorporated Naval Strike Warfare Center, TOPGUN, and Top Dome programs is to provide such tactical training. This training requires greater levels of realism using state-of-the-art equipment at the training ranges. In order to improve realism, the Navy needs to provide diverse combat training scenarios. This can be achieved by using portable visual cueing devices and by installing additional EW systems. Visual cueing devices allow pilots to perform target identification and to simulate enemy sites, such as surface-to-air missile launchers or radar sites. EW sites have been authorized through ROW reservations. It is critical for effective combat training that these devices be portable and easily relocated to multiple sites on different terrain. This mobility provides the flexibility to vary training combat scenarios and to avoid redundant unrealistic tactical combat training events. The current topography of land available to the Navy near the ranges does not provide sufficient terrain or area to simulate all threat environments.

Developing additional EW systems and TACTS would provide greater training capability and would increase the margin of safety in the training ranges. These EW systems provide electronic threat environments, simulating enemy counter attack methods. Additional TACTS systems would provide the flexibility for range operators to increase or decrease the density of simulated threats to pilots and would improve accountability and safety.

Chaff and decoy flares are used with such training. Section 2.3.1 describes these systems in greater detail. EW sites historically were authorized on public lands through BLM right-of way permits. Because of a recent amendment to the BLM's Resource Management Plan, initiated by the BLM Carson City District administrative interpretation of FLPMA, EW sites now can be located on public lands only through the withdrawal process. The Navy will continue to work through BLM direction and policies to locate and establish these systems.

Another critical component of effective combat training is integrated air and ground training, including combat search and rescue, SEAL unit training, noncombatant evacuation training, and desert rescue training. All of these activities require realistic combat training for effective combat performance. Such training requires helicopter insertion/extraction landing zones, parachute drop zones, and foot patrol areas. Search and rescue and reconnaissance training also use desert patrol vehicles (a modified dune buggy) for personnel transports. Such activities require a linear corridor to simulate ingress/egress scenarios and the varying terrain that could be encountered on enemy territory.

The NSAWC FRTC is the only tactical training range where the combat search and rescue mission is conducted. The Navy recently integrated combat search and rescue and intelligence training with NATO allies. The amount of ground training integrated with aircraft support is expected to continue at NAS Fallon, thereby requiring suitable areas for quality training.

The changes in military training requirements and the BLM Carson City District administrative interpretation of FLPMA described above have resulted in the inability of the Navy to meet current training requirements within the footprint of present training range boundaries. In addition to meeting public health and safety concerns, the proposed withdrawal would allow the Navy to meet the training requirements of its current and foreseeable training mission. Any Navy activity that becomes necessary outside of the proposed withdrawal footprint would continue to be coordinated with the BLM or other appropriate agency.

- *Tactical Training Requirements of the Navy:* The strategic importance of NAS Fallon has been further defined under the Defense Base Closure and Realignment Act of 1990 (PL 101-510), commonly referred to as BRAC. Pursuant to this act, many military facilities are being closed or realigned. Three rounds of base closure and realignment decisions have resulted in the closure of many western military facilities, including five Navy facilities in the San Francisco Bay Area alone. Base closure decisions have resulted in the realignment of training missions to facilities, such as NAS Fallon, that were not slated for closure. This has made NAS Fallon and the FRTC more strategically important for the combat readiness of the Navy. The realignment of TOPGUN and Top Dome to NAS Fallon are examples of BRAC actions and demonstrate the long-term commitment of the Navy to NAS Fallon and its tactical importance to the combat readiness of the military.

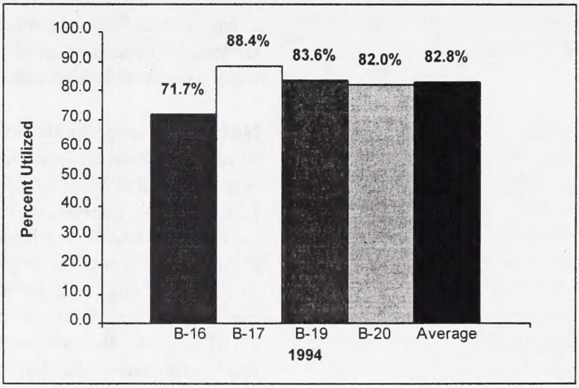
NAS Fallon, along with the FRTC, is the only naval air station capable of providing lodging, support, and integrated combat training for an entire CVW. The Navy requires all CVWs to train at NAS Fallon for four weeks as a prerequisite to deployment aboard aircraft carriers or on overseas stations, highlighting the strategic importance of NAS Fallon. In addition to training for CVWs, NAS Fallon is homeport to an FRS detachment. When deployed to NAS Fallon, CVWs routinely require exclusive use of the portion of the FRTC covered by the TACTS systems that overlies B-17, B-19, and B-20, which can make these ranges unavailable for non-CVW training. FRS units or other activities desiring concurrent use of a training range are scheduled for B-16, which is outside the TACTS tracking area. During these times, the training ranges are fully allocated.

In 1994, 31,147 sorties were flown at the training ranges (US Navy 1995c). A sortie is a take-off and landing and can include up to 12 ordnance deliveries. Such efficient training per sortie is attributable to the proximity of the ranges. The 1994 sorties included over 1,600 from the Air Force and approximately 1,000 from the Marines (US Navy 1995c).

Based on range use data for calendar year 1994, the four training ranges (B-16, B-17, B-19, and B-20) had an average annual utilization rate of 83 percent (US Navy 1995c). Utilization rates are determined by the number of hours used at each range divided by the total hours available at the ranges. Available hours are based on time of day (most operations are conducted during the eight hour work day), range maintenance schedules, and closure schedules for the ranges. Because of these variables, a range is not available 100 percent of the time. Recognizing that a training range is not available 100 percent of the time, the utilization rate of 83 percent is near range capacity. Furthermore, the annual average does not highlight variances in use, such as when both CVW and FRS training activities are being conducted. During these times, demand for use of the ranges often exceeds range availability. Figure 1-2 shows the 1994 utilization rates at each of the ranges. Based on number of actual and projected sorties flown at NAS Fallon, range utilization rates for 1995 to present would be similar to 1994 as shown on Table 1-1.

Figure 1-2

Range Utilization in 1994[1]



Source: US Navy 1995c.

[1] Based on number of actual and projected sorties flown at NAS Fallon, range utilization rates for 1995 to present would be similar to 1994.

Table 1-1
Annual Number of Sorties Flown at NAS Fallon 1994 to 1998[1]

Year	Total Sorties
1994	31,147
1995	29,577
1996	32,227
1997	33,802
1998	30,000

[1] Actual sorties (1994 to 1997) based on NAS Fallon range utilization reports (US Navy 1995c, 1996c, 1997c, 1998a). Projected sorties based on airfield and airspace operational study report (US Navy 1996d).

- *Strategic Location and Cost-effectiveness of the FRTC:* NAS Fallon has the facilities, airspace, weather, remoteness, equipment, ranges, and impact areas necessary to conduct integrated strategic training for Navy forces. Because NAS Fallon is in a remote location, it does not interfere with major civilian airports. Unlike other remote Department of Defense (DOD) air stations, NAS Fallon has the facilities and infrastructure to accommodate an entire CVW, FRS detachment, and visiting Navy, Air Force, Marine, and NATO allies units. The FRTC is set up to simulate contingency operations typical of Navy missions. All of the training ranges are within 30 air miles of NAS Fallon. This allows for integrated range training, promotes fuel efficiency, and reduces risk from travel time. In short, proximity of the ranges minimizes operational costs and maximizes training time, thereby allowing pilots to fly more training missions during their stay at NAS Fallon. Similarly, the ranges are utilized by other aircrews, including those from NAS Lemoore and Nellis AFB.

  Transferring NAS Fallon training functions to other military facilities is unlikely given that the FRTC is already in place. Large continuous tracts of open land and airspace, as required for today's military aircraft training, would be difficult and costly to obtain, even if available. This is discussed in more detail in Section 2.2.

- *Other Concerns Related to Training.* Some uses of lands adjacent to training ranges are incompatible with range operations and can hinder combat training efforts and degrade training.

  New technologies that demand higher levels of combat training, particularly with high-speed low-altitude flights, require wider margins for safe operations. The Navy is concerned about current developments discussed below. Land use compatibility concerns include urban growth near the training ranges and increased public use and development on public lands.

Urban Growth. Most of the recent growth in Churchill County has been west of the City of Fallon toward Sheckler Reservoir, specifically along Highway 50, north of training range B-16. Continued development around Fallon is expected. Development has raised land use conflicts and noise complaints associated with modern training operations at B-16.

Increased Use and Development On Public Lands. As the population has increased in the Fallon area, more people are using public lands, including lands around the NAS Fallon training ranges, for recreation, motorized off-road activities, wildlife viewing, hunting, horseback riding, and mining. The Sheckler Reservoir, north of B-16, is an overflow water storage area that may support occasional recreational activities.

Public lands east of B-17 historically have supported mining activity and contain patented and unpatented mining claims. Most federal lands near training areas support livestock grazing. Hazards to military uses could result from nonmilitary uses in areas adjacent to the training ranges, endangering pilots and aircrews. For example, tall structures built adjacent to the training ranges could pose hazards to low-flying aircraft by forcing aircraft to make nonstandard approaches to the target. Such structures also may be mistaken for targets. The Navy is working with the BLM to develop policies to avoid conflicts between public land use and military training.

1.4.3 Increase Control and Management of Safety Buffers

Several Navy studies identified potential safety hazards associated with the NAS Fallon training ranges. These studies include the Hazard Analysis Mitigation Report (US Navy 1995g), off-range ordnance sweeps conducted near the ranges in 1989 and 1990 (US Navy 1990), the Range Air Installation Compatible Use Zones (RAICUZ) study (US Navy 1982b), and an updated RAICUZ study for B-16 (US Navy 1995, 1997). These studies pointed out the need for a land withdrawal to increase public safety. Each study is discussed individually below in Sections 1.4.3.1 through 1.4.3.5.

Hazards to the public, including off-range ordnance, aircraft mishaps, and objects dropped from aircraft, can result from normal military operations. Ordnance release is addressed in Sections 1.4.3.3 and 3.13.2 of this document. As discussed in these sections, areas likely to be impacted by off-range ordnance have been delineated by off-range ordnance sweeps (US

Navy 1990), a HAZARD analysis mitigation report (US Navy 1995h), and a B-16 RAICUZ study (US Navy 1997); these areas are included in the proposed withdrawal boundary as Category A lands (closed to public use).

Aircraft mishaps and objects dropped from aircraft are discussed in Section 3.13 of this document. Most aircraft mishaps occur at the air station or on FRTC training ranges. Between 1989 and 1996, there were 18 mishaps associated with NAS Fallon operations. Nine occurred on the air station and nine occurred on the training ranges or on public or private sector land. No civilians were involved in the mishaps.

It was estimated that an average of 1.5 parts, consisting primarily of screws and rivets, per 1,000 sorties fall off aircraft (SAIC 1991). Approximately 32,000 sorties were performed at NAS Fallon in 1994, resulting in approximately 50 dropped objects. Most dropped objects occur between the air station and the training ranges. Based on the analysis performed for the Special Nevada Report, the statistical probability of people or structures being struck by dropped objects is infinitesimal. The probabilities of being struck by lightning, dropped ordnance, and dropped objects are $1:10^5$, $1:10^{12}$, and $1:10^{15}$ respectively (SAIC 1991). This generated analysis does not account for proximity to training ranges or airfields (i.e., the chances of being involved in a mishap would be greater closer to the training ranges and airfields). Given that the target areas within the NAS Fallon training ranges and the air station are surrounded by withdrawn or Navy-administered lands, the probability of a mishap approaches the stated statistical probabilities.

1.4.3.1 Hazard Analysis Mitigation Report

The Naval Air Station Fallon Ranges Hazard Analysis Mitigation Report, September 1995, used the HAZARD methodology to identify land surrounding the training ranges necessary to contain the ordnance delivered during training activity (US Navy 1995g). The HAZARD analysis examines effects of live and practice/inert ordnance delivery. Range safety zone A represents the minimum land area needed to contain ordnance deployed during air-to-ground training.

The HAZARD methodology develops safety footprints showing the total ground area needed to contain potential live and practice/inert off-range ordnance for that range based on operational requirements and parameters. The analysis accounts for specific types of aircraft, types of ordnance, delivery parameters (including dive angle, release altitude, aircraft heading, and airspeed), terrain, and self-imposed operational restrictions. Range composite weapons safety footprints are developed by combining the requirements and parameters for footprints developed for specific targets on each range. Appendix D provides the executive summary and addendum of the HAZARD report. The range composite weapon safety footprints for B-16, B-17 and B-19 are presented on Figure 1-3. The safety footprint for B-20 is within the existing range boundary (US Navy 1995g; US Navy 1995h).

1.4.3.2 RAICUZ Study for the B-16 Range Complex

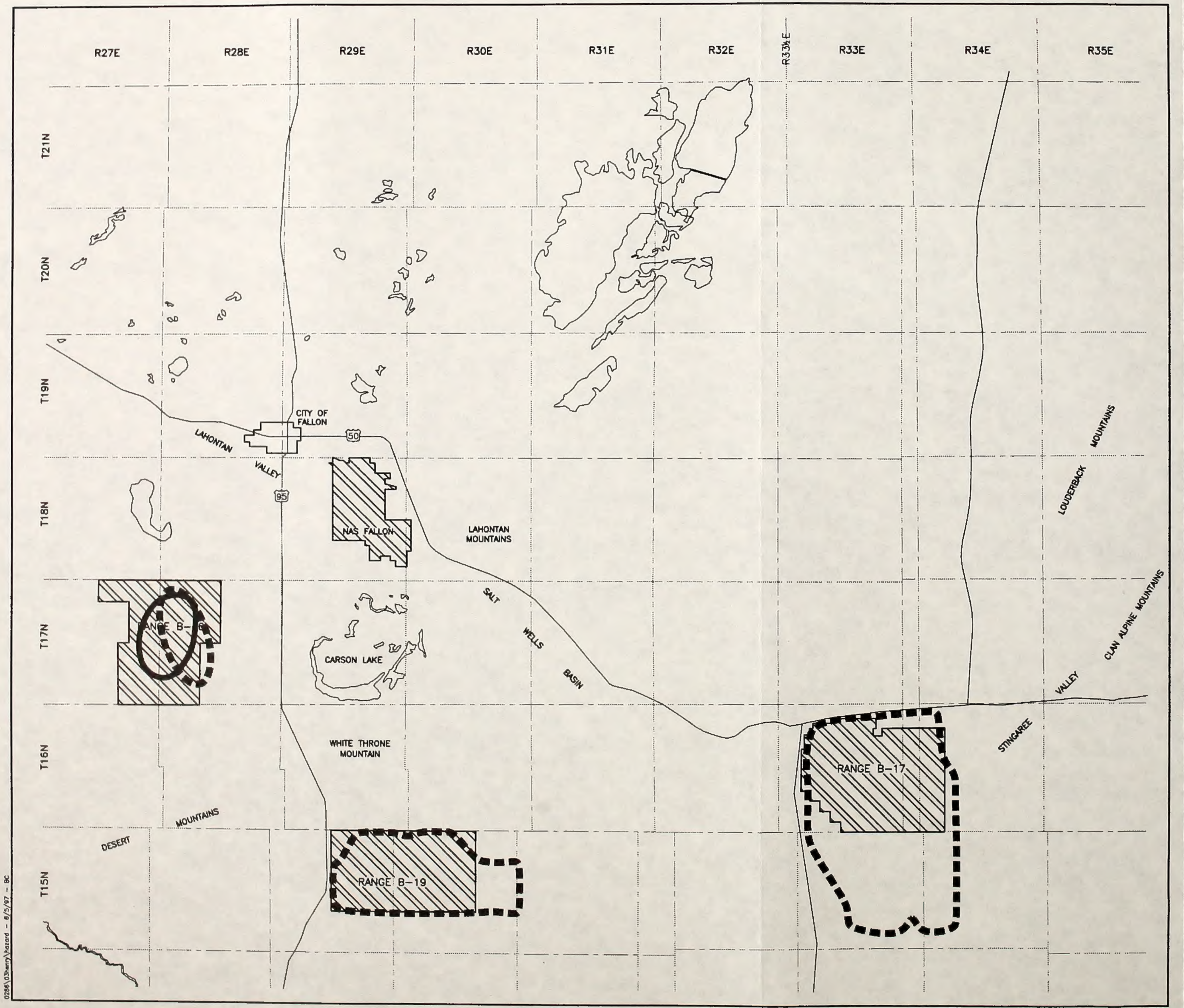
Several factors have changed since the 1982 RAICUZ study was performed that prompted the Navy to undertake an updated RAICUZ analysis for B-16. The use of different aircraft, changes in growth patterns west of the City of Fallon, and changes in flight patterns are among these factors. The changes in aircraft flight patterns, resulting in part from concerns voiced by state officials and residents of the Sheckler District north of B-16 that noise levels from overflights near B-16 be reduced, include the recent realignment of 12 MTRs to terminate at B-20, and the proposed changes to the flight patterns and airspace designations around B-16 (Section 5.6.5).

The Navy conducted noise studies for these actions in 1995 and 1996; the results of these studies are discussed in Section 5.6.6.7 of this document. The revised B-16 RAICUZ Study is based on the noise data presented in the new noise studies, updated weapon safety footprints (see Section 1.4.3.5), and armed overflight zones (see Section 1.4.3.4). The revised B-16 RAICUZ range safety zones (RSZ) are shown on Figure 1-4. Since the 1982 RAICUZ study, the average noise exposure has decreased substantially. The 1982 RAICUZ study encompassed almost twice as much area in the 65 to 75 Ldn (day-night average noise level) range over B-16 as the 1997 RAICUZ study. The majority of lands within this 1997 area are immediately to the west of the targets and over the B-16 training range. In addition, the noise exposure levels above 75 Ldn have decreased dramatically since 1982.

RSZ A is the surface impact area and is centered on the range targets. The area of armed overflight where the pilot arms the weapon system is referred to as RSZ B. RSZ C is the area of safety concern and coincides with the restricted airspace. RSZ A has decreased slightly in size, while both RSZ B and RSZ C have decreased dramatically in size since 1982. RSZ C, in particular, has decreased from over 167,000 acres to less than 30,000 acres, and is limited to the restricted airspace in the immediate vicinity of the range. There are no residences located under RSZ A or RSZ B. There are 12 residences located under the northeast extreme outside boundary of RSZ C.

The major findings of the 1997 RAICUZ include the following:

- RSZ A is entirely within the B-16 training range; portions of RSZ B and RSZ C are located outside the range on undeveloped federal land.



LEGEND:
▨ NAS Fallon and Ranges
Weapon Safety Footprint (RSZ A) (current conditions)
Weapon Safety Footprint (RSZ A) (Proposed B-16 Modifications)
N
0
2.5
5
1"=5MI.
(APPROXIMATE)

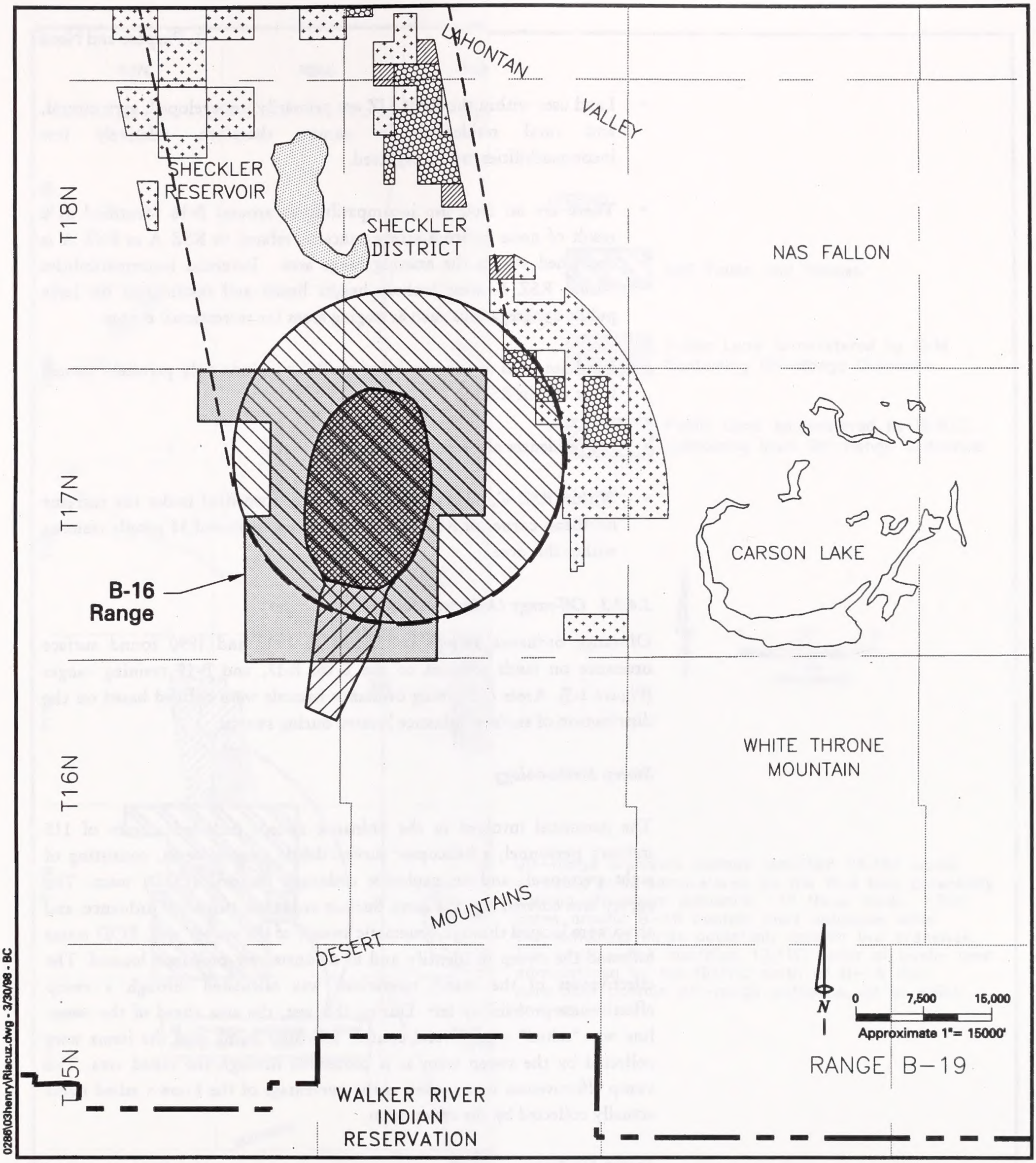
The 1995 Hazard Study and the revised 1995 RAICUZ Study for B-16 developed weapon safety footprints for the training ranges. A 1997 RAICUZ Study for B-16 developed a weapon safety footprint for B-16 based on modified run-in lines as discussed in Section 5.6.3.

Weapon Safety Footprints

NAS Fallon, Nevada

Figure 1-3

Source: U.S. Navy 1995g; 1995h; 1996c.



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RSZ A covers the target area and RSZ B covers the run-in line.

Source: US Navy, 1997

B-16 RAICUZ Study

NAS Fallon, Nevada

Figure 1-4

- Land uses within the RAICUZ are primarily undeveloped, agricultural, and rural residential in nature; therefore, relatively few incompatibilities can be expected.

- There are no land use incompatibilities around B-16 identified as a result of noise or from safety concerns related to RSZ A as RSZ A is contained within the existing range area. Potential incompatibilities within RSZ B areas include height limits and restrictions on large public congregations such as staging areas for recreational events.

- Land use areas of concern based on RSZs include only privately owned lands within RSZ C.

- No residences are located within RSZ A or B.

- Within RSZ C, 12 residential units were identified under the extreme northeast corner of RSZ C, resulting in an estimated 31 people residing within this area.

1.4.3.3 Off-range Ordnance Sweeps

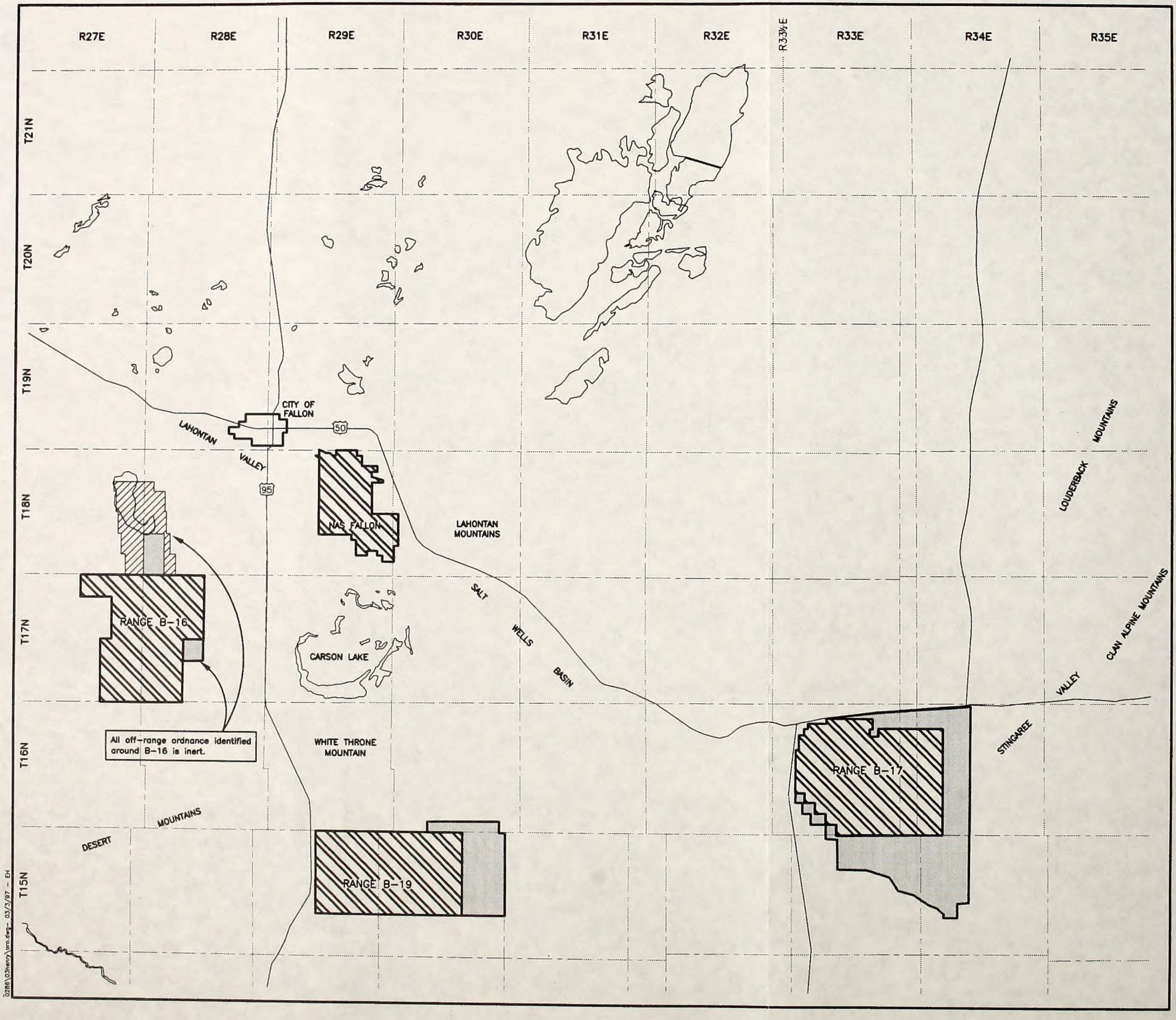
Off-range ordnance sweeps conducted in 1989 and 1990 found surface ordnance on lands adjacent to the B-16, B-17, and B-19 training ranges (Figure 1-5). Areas containing ordnance hazards were defined based on the distribution of surface ordnance located during sweeps.

Sweep Methodology

The personnel involved in the ordnance sweeps included a team of 115 military personnel, a helicopter survey/debris removal team, consisting of eight personnel, and an explosive ordnance disposal (EOD) team. The survey area covered 226,592 acres. Surface ordnance, suspected ordnance, and scrap were located through systematic sweeps of the survey area. EOD teams followed the sweep to identify and to detonate any ordnance located. The effectiveness of the search operations was calculated through a sweep effectiveness probability test. During this test, the area ahead of the sweep line was “salted” with several control ordnance items, and the items were collected by the sweep team as it proceeded through the salted area. The sweep effectiveness is expressed as the percentage of the known salted items actually collected by the sweep team.

Sweep Findings

This analysis determined that 24,464 acres of land now administered by the BLM contain off-range ordnance and should be closed to protect the public



LEGEND:
▨ NAS Fallon and Ranges
▨ Public Land Administered by BLM Containing Off-Range Ordnance
▨ Public Land Administered by BUREC Containing Inert Off-Range Ordnance
N
0
2.5
5
1"=5MI.
(APPROXIMATE)

Off-range ordnance sweeps identified 24,464 acres of public land administered by the BLM that potentially contain off-range ordnance. Of these lands, 1,920 acres around B-16 contain inert ordnance while the remaining lands potentially contain live ordnance. The sweeps also identified 12,180 acres of public land administered by the BUREC north of B-16 that potentially contain off-range ordnance, all of which is inert.

Off-Range Ordnance Lands

NAS Fallon, Nevada

Figure 1-5

Source: USFWS 1995

from exposure to ordnance hazards (US Navy 1990). In January 1991, the BLM requested the Navy to post notices or to fence off all 24,464 acres and requested that the Navy submit a withdrawal application. Approximately 16,714 acres of this area overlapped the areas that were previously identified in the 1982 RAICUZ recommendation for withdrawal. Therefore, approximately 7,750 additional acres were recommended for withdrawal on the basis of the sweeps. BLM and the Navy agree that such closed properties should be withdrawn and placed under Navy control and management.

The BLM land near B-16 contained only practice ordnance, which may or may not have spotting charges or other reactive materials for scoring purposes, but has no live explosive fillers (see Section 3.13). Practice ordnance may be described as inert ordnance, though to be classified as inert, ordnance must be verified by an inspector and then certified as inert. An additional 12,180 acres north of B-16 and administered by BUREC were found to contain practice/inert ordnance (Figure 1-5). The BUREC did not request that the Navy fence or withdraw these lands. Should the BUREC ever propose to relinquish its control of these public lands, the Navy would submit an application to BLM for withdrawal.

The effectiveness of sweeps in clearing surface ordnance is estimated to be 92.7 percent. This means that approximately seven percent of off-range ordnance has not been identified. Subsurface off-range ordnance is more likely to remain than surface ordnance, given the difficulty of locating it. New ordnance remediation technology has been developed by the Naval Research Laboratory. This technology, tested at the Badlands Bombing Range in South Dakota and demonstrated at several other test ranges throughout the country, had an estimated detection efficiency of 96 percent. NAS Fallon is working with the Walker River Paiute Tribe to investigate the potential use of this technology for off-range ordnance lands at NAS Fallon. Section 3.13 provides additional information on off-range ordnance sweep methodology and results.

In December 1989, the Navy, BLM, and the Nevada Department of Conservation and Natural Resources signed a memorandum of agreement requiring the Navy to conduct annual reconnaissance sweeps around the training ranges for off-range ordnance. The memorandum of agreement, updated in 1995, provides a process for the retrieval, transport, and disposal of off-range ordnance (US Navy 1995j). The memorandum will terminate upon implementation of the proposed action, though the Navy will continue the sweeps.

1.4.3.4 Armed Overflight Zones

RSZ B begins where the pilot arms the weapon system. Arming is required for both practice/inert and live ordnance. Inadvertent release of ordnance in these areas could pose safety hazards to other users. Land uses that have the potential to attract congregations of people or require structures above 50 feet in height are not compatible in RSZ B.

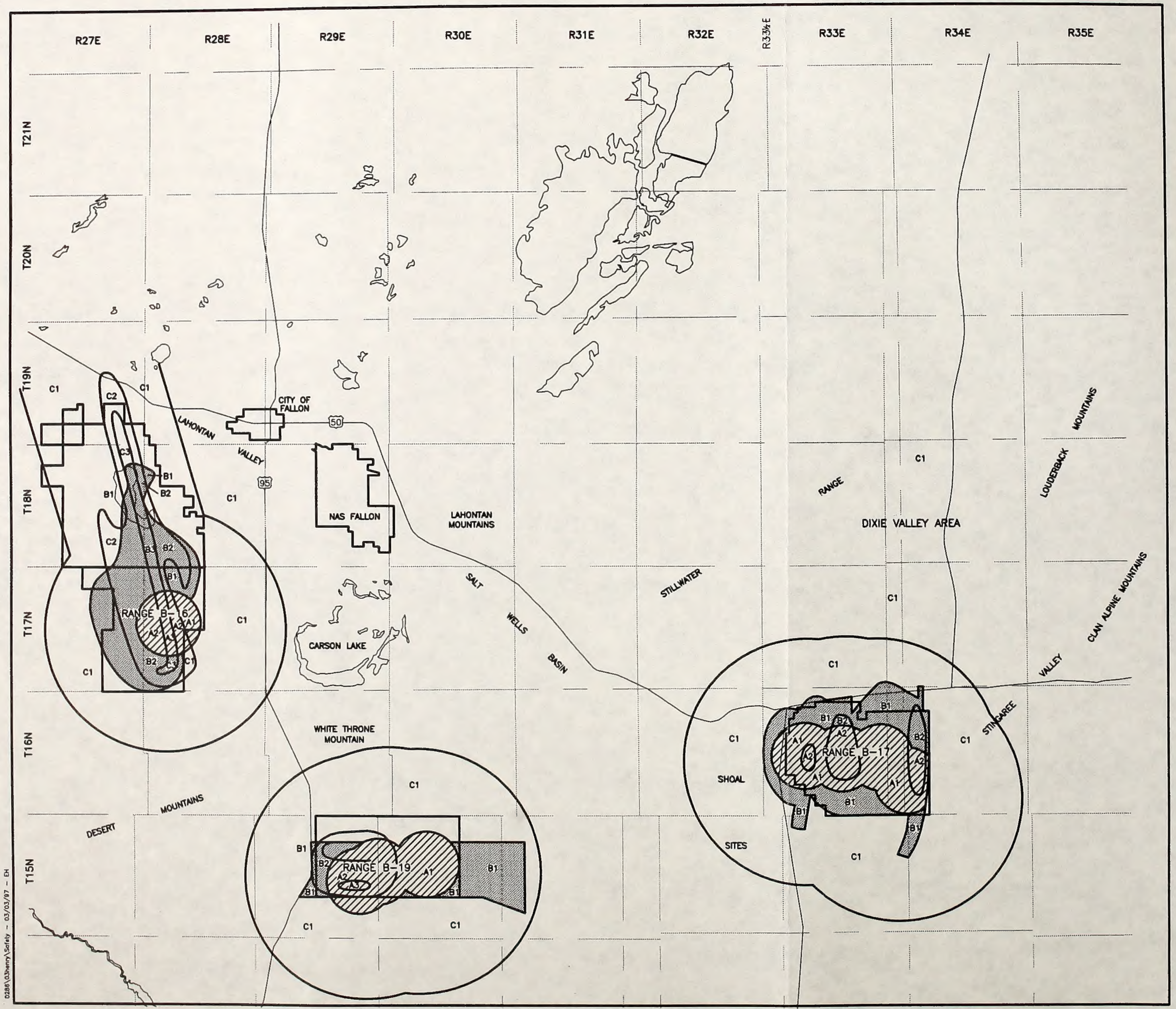
The distance from the target at which arming occurs is determined by the location of the targets on the range as well as the weapons delivery tactics selected on those targets. Ingress to the target and electronic warfare threats also need to be taken into consideration.

The armed overflight zone for the B-16 modifications discussed in Section 5.6.5 begins south of the southern range boundary, as shown in Figure 1-4. It continues to where it meets RSZ A. The RSZ B area south of B-16 was not needed for withdrawal because the Navy and BLM agreed that the BLM could effectively manage this area by implementing land use restrictions, such as height limitation, in armed overflight areas. For B-17 and B-19, the overflight zones begin at points coincident with or well inside the proposed withdrawal boundaries. The BLM can not manage armed overflight areas associated with these two training ranges because these areas are also proposed for integrated air and ground training.

1.4.3.5 RAICUZ Study

The 1982 RAICUZ study identified areas surrounding the training ranges where the possibility of accidents and the level of noise from Navy activities exceed Navy guidelines for nonmilitary land uses. The study mapped noise contours for each range, identified areas where potential noise and safety hazards conflict with existing land use, and recommended withdrawal buffer areas for each range (summarized in Figure 1-6). The RAICUZ analysis was used to determine the original land withdrawal footprint, recommending that 181,323 acres of federally controlled land around the training ranges be withdrawn to provide for tactical training and to create a buffer. Appendix C presents an overview of the RAICUZ process and a summary from the RAICUZ report.

Since the 1982 RAICUZ was conducted, the studies above (see Section 1.4.3) were conducted to address range safety requirements and to revise the RAICUZ findings. These efforts updated and improved upon the 1982 RAICUZ modeling process, refining the data and analysis and providing for changes in types of aircraft and training at NAS Fallon and the FRTC. A summary of the 1982 RAICUZ report is presented in this EIS to express the need for the original proposed action (Alternative I). The other alternatives evaluated in this FEIS reflect the findings of more recent studies.



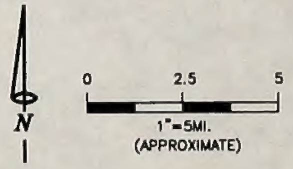
LEGEND:

▨ Range Safety Zone (RSZ) A
Noise Zone (NZ) 1-3 (subzones A1,A2,A3)

▩ Range Safety Zone (RSZ) B
Noise Zone (NZ) 1-3 (subzones B1,B2,B3)

☐ Range Safety Zone (RSZ) C
Noise Zone (NZ) 1-3 (subzones C1,C2,C3)

Key
RSZ A = Minimum surface impact area around targets, zone of maximum concern
RSZ B = Area of armed overflight, zone of moderate concern
RSZ C = Minimum restricted airspace, zone of minimum concern
NZ 1 = 65 L_{dn} and below
NZ 2 = 66 through 75 L_{dn}
NZ 3 = 76 L_{dn} and above
Ldn = Average noise level day/night in decibels



The 1982 RAICUZ Study provides detailed analysis of safety and noise zones around the training ranges. The results of this study were used to develop the original (Alternative I) proposed land withdrawal area.

RAICUZ Study: Range Safety Zones and Noise Zones

NAS Fallon, Nevada

Figure 1-6

Source: U.S. Navy, 1982b.

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1.5 PUBLIC INVOLVEMENT

1.5.1 Public Scoping

Pursuant to NEPA, a public scoping process for the land withdrawal EIS was conducted from May 12, 1995, through July 7, 1995. The public was notified of the Navy's intent to prepare this EIS by a notice of intent (NOI) published in the May 12, 1995, issue of the Federal Register (Vol. 60, No. 92). To initiate the scoping process, a public notice was published on two consecutive days in two local newspapers, the Reno Gazette-Journal and Lahontan Valley News. Scoping letters, with an attached summary of the proposed public land withdrawal, were mailed to over 200 public agencies, public interest groups, and individuals either known to have an interest in or expected to have an interest in the land withdrawal. Appendix B lists the agencies, organizations, and individuals on the distribution list.

Both the scoping letter and public notices invited written comments and announced that public scoping meetings would be held at the Airport Plaza Hotel in Reno, Nevada, on June 6, 1995, and at the Fallon Convention Center in Fallon, Nevada, on June 7, 1995. Each scoping meeting was attended by approximately 80 individuals, including agency representatives and members of the public. Approximately 40 individuals spoke at the meetings. During this EIS scoping process, 53 letters were received from members of the public, interested groups, and federal, state, and local agencies. The written and oral comments identified several issues and areas of concern.

Comments addressed public land access, airspace safety and availability, noise levels, biological resources, water supply and rights, socioeconomic effects, land use compatibility, public health and safety, and cultural resources. Respondents requested that the EIS address a full range of alternatives, including relocating B-16, and present the alternative selection process.

Comments urged NAS Fallon to make the best use of lands currently under its management and to withdraw the least amount of land possible. In response, the proposed configuration was changed to include a corridor of Navy-owned land connecting to the Dixie Valley area proposed for withdrawal.

In response to public scoping comments related to noise north of B-16 in the Sheckler District, the Navy initiated operational changes at B-16. These changes, discussed in Section 5.6.5, would revise current flight patterns to reduce noise levels north of B-16 in the Sheckler District. The BLM published a NOI for these modifications in the Federal Register and held an open house on July 17, 1996, to discuss these changes. The Navy is continuing to work closely with FAA regarding these changes and this issue.

Public scoping also was conducted for the land withdrawal proposal in 1982 and 1987. These scoping processes included publishing notices in the Federal Register and local papers, conducting scoping meetings, and sending notification letters. Comments received during these periods were similar to those discussed above and were considered in the EIS.

1.5.2 Draft EIS

The public was invited to review and comment on the DEIS. A notice of availability was published in the Federal Register on July 10, 1997. Public notices were mailed to those on the mailing list (Appendix B). Ads were published in the Reno Gazette and Lahontan Valley News on September 8 and 9, 1997, and September 14 and 15, 1997. The DEIS was circulated for public and agency review from July 10, 1997 to October 10, 1997. This public comment period of 90 days (required to be at least 45 days under NEPA) provided an opportunity for the public to review the issues addressed in the impact analysis and to offer comments on any aspect of the process. The distribution list is included as Appendix B.

Public hearings were held on September 16, 1997, in Reno, Nevada, and on September 17, 1997, in Fallon, Nevada, to formally receive verbal and written comments on the DEIS. The locations, dates, and times of the meetings were announced in the media and were included in a letter mailed to those on the distribution list. Open houses were held prior to each public meeting to give the public an opportunity to discuss their concerns with Navy representatives. Approximately 30 individuals attended the open house, 60 individuals attended the public hearing, and 23 individuals presented oral comments in Reno, Nevada. Approximately 16 individuals attended the open house, 52 individuals attended the public hearing, and 15 individuals presented oral comments in Fallon, Nevada. Comments and responses to the comments are provided as Volume II of this FEIS. An additional meeting was held in Austin, Nevada on September 30, 1997, to respond to concerns of citizens of Eureka and Lander Counties voiced at the Reno and Fallon public hearings. Approximately 50 individuals attended this meeting.

1.5.3 Final EIS

This FEIS incorporates and responds to comments received on the DEIS. As required under NEPA, there will be a 30-day no action period after the

FEIS is published. After the 30-day no action period, a ROD) will be prepared.

1.6 OTHER RELATED ACTIONS

The Military Lands Withdrawal Act of 1986 (Public Law 99-606) withdrew Bravo-20 Training Range, Nevada (21,576 acres); Nellis Air Force Range, Nevada (2,945,000 acres); Barry M. Goldwater Air Force Range, Arizona (2,664,423 acres); McGregor Range, New Mexico (608,385 acres); Fort Greely Maneuver Area (571,995 acres) and Fort Greely Air Drop Zone, Alaska (51,590 acres); and Fort Wainwright Maneuver Area, Alaska (247,952 acres). Section 6 of the act specified that "no later than five years after the date of enactment of (the) Act, the Secretary of the Air Force, the Secretary of the Navy, and the Secretary of the Interior shall submit to Congress a joint report." This report, entitled the "Special Nevada Report," was to include an analysis and evaluation of the effects on public health and safety resulting from DOD and DOE military and defense-related uses on withdrawn public lands in Nevada and in airspace overlying the state. The Draft Special Nevada Report was released to the public in December 1990; the final report was released in 1991. Although not a NEPA document, the report contains an extensive analysis of the cumulative environmental effects of military land withdrawals in Nevada.

The Military Lands Withdrawal Act also requires the Navy and Air Force to prepare environmental impact statements that analyze the potential environmental effects of their continued use of withdrawn lands in Nevada. The Navy's EIS will be completed by November 1998.

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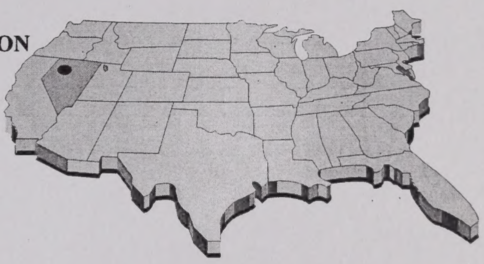


2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION 2-1

2.2 ALTERNATIVES 2-3

2.3 USES AND CLASSIFICATION OF WITHDRAWN LAND 2-15

2.4 SUMMARY OF ENVIRONMENTAL IMPACTS 2-43

2. PROPOSED ACTION AND ALTERNATIVES

This chapter presents the proposed action, alternative selection process, alternatives considered in detail, and alternatives considered but eliminated. Land use classifications that would be applied to the withdrawn areas are discussed, along with reasonably foreseeable military activities on the withdrawn lands. All alternatives considered in detail are consistent with the purpose and need described in Chapter 1 and represent reasonable choices of options that meet safety, training, and mission requirements of NAS Fallon. A comparison of the relative environmental impacts of each alternative also is provided. Detailed analyses of environmental consequences and proposed mitigations are presented in Chapter 4.

2.1 PROPOSED ACTION

The Navy proposes to withdraw federally administered land around NAS Fallon training ranges to facilitate and improve the realistic operational and strategic combat training conducted there and to provide public safety buffers. All lands proposed for withdrawal are now administered by the BLM, BUREC, or DOE.

As discussed in Section 2.2, three action alternatives are evaluated in detail. These alternatives would withdraw between 127,365 and 189,080 acres of public land around NAS Fallon training ranges B-16, B-17, B-19, the shoal site, and the Dixie Valley area. The total of all the alternative withdrawal footprints would include lands north, west, and southeast of B-16; lands north, south, east, and west of B-17; and lands north, west, and east of B-19. Lands at the shoal site and Dixie Valley area also are included for withdrawal. Under each action alternative, all lands known to be contaminated or having the potential to be contaminated with ordnance would be withdrawn (see Sections 1.4.3.1 and 1.4.3.3 and Figures 1-3 and 1-5). Specific acreages and maps of the withdrawal areas for each alternative are presented in Sections 2.2.2 and 2.3.3. The Navy would withdrawal the 2,765 acres of DOE land at the shoal site under all action alternatives. The DOE would retain responsibility for all subsurface resources and activities. The Navy would be responsible only for surface training activities.

The withdrawn lands under each alternative would be placed in one of two land use categories: Category A, Exclusive Navy Use, Potential Ordnance Hazard; or Category B, Navy and Public Use, Limited Land Use Conflicts. Category A includes approximately 40,280 acres of land east of B-16, north, south, and east of B-17 and north and east of B-19. Category B includes all remaining withdrawal lands.

Category A lands will be managed by the Navy and will be closed to public uses. Category B lands will be managed by the Navy in conjunction with the BLM, BUREC, and DOE and will remain open to public use with the exception of fenced EW sites. All lands will be managed under a resource management plan that has been developed by the Navy, in coordination with the BLM, BUREC, and DOE. This management plan provides specific land use policies for the withdrawn lands in conformance to those presented in this FEIS (Appendix J). The land use categories are discussed in detail in Section 2.3.2.

The land withdrawal will not cause an increase in total air operations or the size of the training range impact areas. Realistic military combat training requires using visual cueing devices, developing EW and TACTS sites, and employing tactical training scenarios, including ground-based combat search and rescue, close air support operations, and the use chaff and flares.

Up to five EW or TACTS sites and up to 50 sites for visual cueing devices could be developed on the withdrawn lands. Each EW site would occupy fewer than five acres, and each TACTS and visual cueing device site would occupy up to one acre. The maximum land area that would be disturbed if five EW sites and 50 visual cueing device sites were developed would be 75 acres. Although the exact locations of these sites have not been identified, all will be on withdrawn lands in the Dixie and Fairview Valley areas and east of B-19. Not all visual cueing device sites would be occupied at one time (i.e., there would never be 50 visual cueing devices on the withdrawn lands at one time). Typically, only three to six visual cueing devices are used at a time during air wing training events.

Integrated air and ground training activities also will take place on the withdrawn lands. A typical ground training portion of the exercise will consist of two vehicles and six personnel. Under desert rescue scenarios, the most intensive training event will consist of four vehicles, two helicopters, and up to 15 personnel. Not all of these forces will be located at the same site at the same time. If other public land users are on the withdrawn land to be used for training, the Navy would avoid other public land users. These activities are described in detail in Section 2.3.1.

All EW, TACTS, and visual cueing device sites will be located away from sensitive resources to avoid adverse impacts and will undergo National Historic Preservation Act, Section 106, and Endangered Species Act, Section 7, consultations as appropriate. All actions at the shoal site would take place at or above the ground surface—no subsurface disturbance is proposed.

Any military use that became necessary outside of the proposed withdrawal footprint would continue to be coordinated with the BLM or other appropriate agency; the proposed land withdrawal alleviates the need to use other BLM lands in most cases.

2.2 ALTERNATIVES

2.2.1 Alternatives Formulation Process

In developing potential alternatives, the Navy coordinated a number of actions, including the following:

- Assessed current and future training and operational requirements for the FRTC;
- Conducted RAICUZ and noise modeling analyses, off-range ordnance sweeps, and HAZARD modeling to assess, quantify, and illustrate safety hazards on lands around the training ranges;
- Consulted with the BLM on their administrative authority to manage land for public safety and the Navy mission;
- Identified types of land uses incompatible with military operations;
- Established an interdisciplinary team of Navy environmental planners, training range operators, natural resource specialists, ordnance experts, flight commanders, and real estate specialists;
- Consulted with the BUREC, Federal Aviation Administration (FAA), DOE, Bureau of Indian Affairs, state of Nevada, and other federal, state, and local agencies and organizations with an interest in the action; and
- Conducted public scoping in 1982, 1987, and 1995 (Section 1.5 and Appendix A).

From this process, seven action alternatives, in addition to the No Action Alternative, were developed. To determine if the alternatives were reasonable and would meet the purpose and need of the proposed action, three evaluation criteria were established. For an alternative to be considered in detail, it had to fulfill all three evaluation criteria summarized below.

1. The action must preserve the training mission of NAS Fallon, as required for national defense. To achieve this the action must:

- Monitor and prevent incompatible land uses that could jeopardize aircrew safety or military training needs, including high- and low-altitude high-speed aerial weapons training.
- Plan land withdrawal configuration to facilitate the combat search and rescue, close air support, and other small ground training operations, such as those conducted by groups of special forces personnel. Maintain and improve state-of-the-art realistic military combat training, including the continued use of chaff, installation of EW, TACTS, and visual cueing devices, and combat search and rescue and close air support training scenarios.
- Allow for the most effective and efficient use of training time while minimizing fuel consumption and unnecessary expenditure of aircraft service life in a nonproductive transit mode.

2. The action must protect the public from safety hazards that relate to air-to-air combat training, evasive air-to-ground combat tactical training, and ordnance delivery training. Potential hazards include off-range ordnance and low-flying aircraft. To achieve this, the action must meet the requirements of the HAZARD modeling report for all training ranges and the B-16 RAICUZ study; and must protect the public from areas that are known to be contaminated with off-range ordnance.

3. The action must minimize disruption of the BLM mission to provide for multiple uses on federal lands and the BUREC mission to administer the Newlands project. The action also should allow maximum public access within safety parameters by minimizing the size of the withdrawal area and by limiting restrictions proposed for withdrawn lands. In addition, the action should not interfere with BUREC operations of the Newlands reclamation project.

   The BLM's mission is to manage, protect, and improve lands to serve the needs of the public for all times. Management is based on the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air, and scenic, scientific, and cultural values.

2.2.2 Alternatives Considered in Detail

Three action alternatives were determined to meet the identified purpose and need, and these are analyzed in detail in the FEIS. Alternative II has been selected as the preferred alternative because it meets most training and safety requirements and minimizes the amount of land proposed for withdrawal. All action alternatives considered withdraw the lands known to contain off-range ordnance. The alternative withdrawal footprints are shown on Figure 2-1. Table 2-1 provides the proposed withdrawal acreages for each alternative by training area. Section 2.3 provides detailed maps and discussions of each withdrawal alternative. The alternatives considered in detail are summarized below.

- *Alternative I.* Approximately 189,080 acres would be withdrawn. The withdrawal footprint would include all lands recommended for withdrawal in the 1982 RAICUZ study (181,323 acres) plus additional lands closed as a result of off-range ordnance sweeps but not included within the original RAICUZ footprint (7,750 acres). This alternative represents the footprint of the original Master Land Withdrawal proposal, as amended in 1992.

  This alternative meets safety requirements and provides additional land for EW and TACTS site development in the Dixie and Fairview Valley area and east of B-19. The footprint, however, does not contain a corridor connecting the Navy-owned Dixie Valley land holdings with the rest of the Dixie Valley area. Such a corridor is important in maximizing the use of existing Navy land and in providing the necessary land for integrated air and ground training (see Section 1.4.2).

- *Alternative II (Preferred Alternative).* Approximately 127,365 acres of land would be withdrawn, about 62,000 acres less than under Alternative I. Much of the land identified in Alternative I, particularly the land identified as range safety zone C north of B-16 and in the Dixie Valley area in the 1982 RAICUZ study, can be managed effectively under the administrative authority of the BLM with Navy review and approval. The lands identified for withdrawal are those lands of immediate importance to the Navy training mission and intended for flexible use in support of that mission or those lands that pose a potential hazard to public safety. BLM administrative processes are not designed to support this kind of use.

  Approximately 6,100 acres north of B-16 would be withdrawn because of practice/inert off-range ordnance and for integrated air and ground training activities. Lands east of the range would be withdrawn because of off-range ordnance and public safety. Approximately 1,500 acres of land in the Dixie Valley area, just north of Highway 50 and northwest of B-17, would be included (areas in blue on Figure 2-1). This area would provide a continuous land management link between the Dixie

TABLE 2-1
COMPARISON OF ALTERNATIVES BY ACREAGE

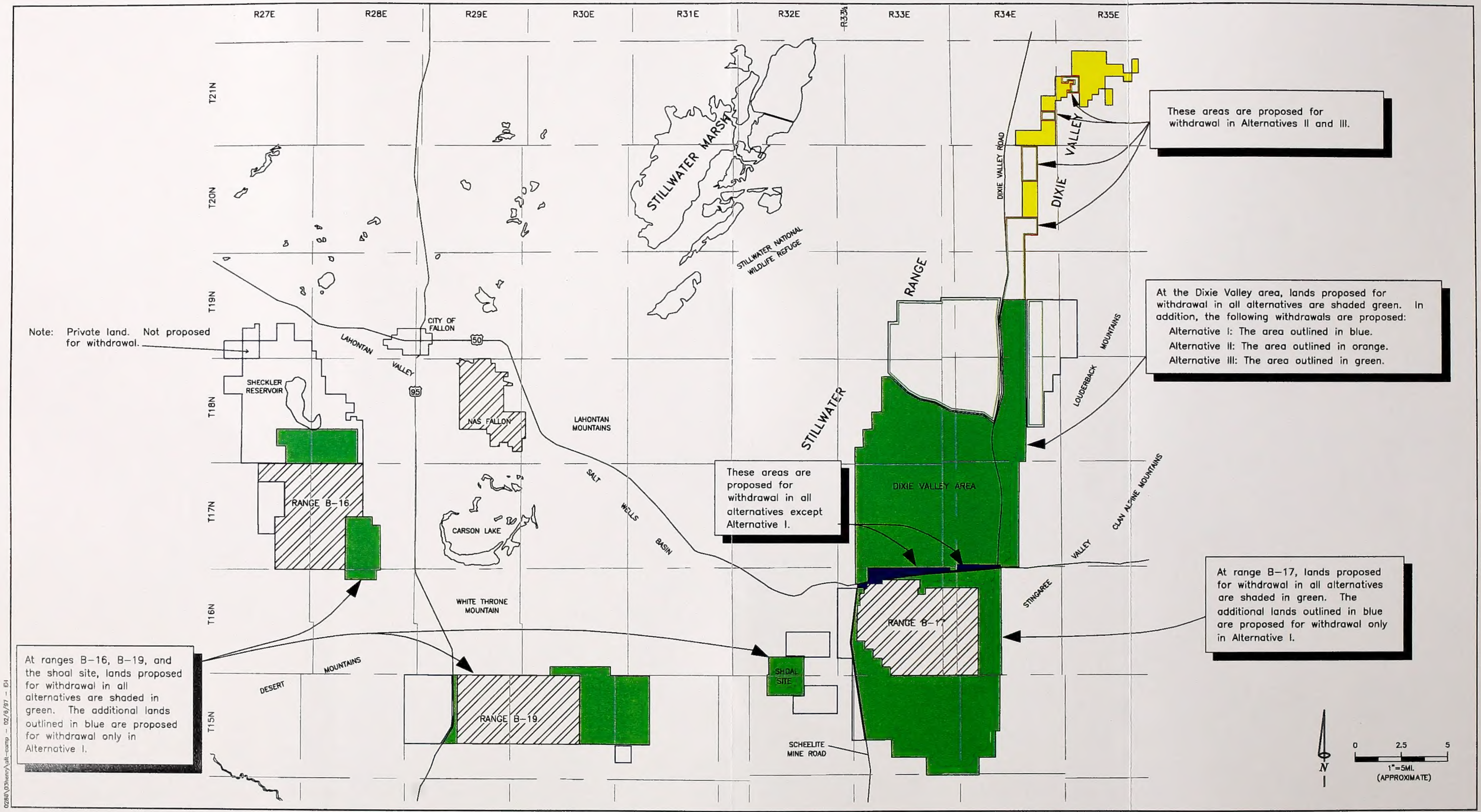
Withdrawal Area	Existing Acreage[1]	Alternative I[2]			Alternative II (Preferred)[2]			Alternative III[2]			No Action Alternative[2]
		Category A	Category B	Total	Category A	Category B	Total	Category A	Category B	Total	
B-16	17,280	640	33,385	34,025	640	9,760	10,400	640	9,760	10,400	0
B-17	21,400	33,400	2,495	35,895	33,400	0	33,400	33,400	0	33,400	0
B-19	17,332	6,240	12,840	19,080	6,240	5,960	12,200	6,240	5,960	12,200	0
Shoal Site	0	0	7,405	7,405	0	2,765	2,765	0	2,765	2,765	0
Dixie Valley area	200 (ROW)	0	92,675	92,675	0	68,600	68,600[3]	0	94,000	94,000[3]	0
TOTAL	56,212	40,280	148,800	189,080	40,280	87,085	127,365	40,280	112,485	152,765	0

ROW: Right-of-way permits issued by the BLM to the Navy

[1] Current withdrawn acreage

[2] Additional approximate acreage proposed for withdrawal

[3] Includes 6,100-acre panhandle



These areas are proposed for withdrawal in Alternatives II and III.

At the Dixie Valley area, lands proposed for withdrawal in all alternatives are shaded green. In addition, the following withdrawals are proposed:
Alternative I: The area outlined in blue.
Alternative II: The area outlined in orange.
Alternative III: The area outlined in green.

Note: Private land. Not proposed for withdrawal.

These areas are proposed for withdrawal in all alternatives except Alternative I.

At range B-17, lands proposed for withdrawal in all alternatives are shaded in green. The additional lands outlined in blue are proposed for withdrawal only in Alternative I.

At ranges B-16, B-19, and the shoal site, lands proposed for withdrawal in all alternatives are shaded in green. The additional lands outlined in blue are proposed for withdrawal only in Alternative I.

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The three action alternatives would withdraw varying amounts of land around the NAS Fallon training ranges. The No Action Alternative would not withdraw any land.

LEGEND:

▨ NAS Fallon and Ranges

🟨 Navy-owned Land in Dixie Valley

🟩 Proposed for Withdrawal in all Alternatives

— Additional Land Proposed for Withdrawal in Alternative I

— Additional Land Proposed for Withdrawal in Alternative II

— Additional Land Proposed for Withdrawal in Alternative III

Source: Tetra Tech

Comparison of Alternative Withdrawal Footprints

NAS Fallon, Nevada

Figure 2-1

Valley area and B-17. Lands within the Nevada Department of Transportation Highway 50 right-of-way are not included in the withdrawal.

This withdrawal footprint differs from Alternative I in that a portion of the shoal site, the land west of B-16, the land west of Highway 95 near B-19, the land in the Job Peak Wilderness Study Area (WSA), and the land west of Scheelite Mine Road near B-17 would not be withdrawn. Approximately 21,000 acres north of B-16 proposed under Alternative I would not be withdrawn.

As part of this withdrawal, a parcel of land approximately one mile wide (one section wide) will connect the major portion of the Dixie Valley withdrawal with the Navy-owned property on the north end of the valley. This panhandle will facilitate better use of withdrawn public land and Navy-owned property by permitting uninterrupted movement of ground personnel from one area to the other. Additionally, it will permit the placement and movement of visual cues and mobile EW sites the entire length of the valley, which will add greatly to the realism of the training scenarios created in support of all NSAWC- and CNO-sponsored training missions. The Dixie Valley area footprint provides a variety of rugged and flat terrain to simulate possible enemy environments. The acreage also would support required integrated air and ground training operations, such as rescuing downed pilots, and developing EW, TACTS, and visual cueing device sites. Alternative II includes all lands closed to the public due to the presence of off-range ordnance. This withdrawal will not include the Nevada Department of Transportation right-of-way along the Dixie Valley Road.

- *Alternative III.* Under this alternative, approximately 152,765 acres would be withdrawn. The footprint is similar to Alternative II but includes more land in the northern portion of the Dixie Valley area. It also includes the land just north of Highway 50 and northwest of B-17 and the corridor of land that connects the Dixie Valley area to Navy-owned lands in Dixie Valley.

Alternative III allows for integrated air and ground training and operations in concert with carrier air wing training. It allows for multiple realistic training scenarios that require the pilot to react to different combat situations. It provides adequate land for placing realistic visual cueing devices. As compared to Alternative II, the larger Dixie Valley area with the panhandle would allow for maximum combat training flexibility but would withdraw more land. All land known to contain off-range ordnance would be withdrawn.

Alternative III differs from Alternative I in that approximately 21,000 acres north of B-16, a portion of the shoal site, the land west of B-16, the land west of Highway 95 near B-19, and the land west of Scheelite Mine Road would not be withdrawn.

- *No Action Alternative.* Under the No Action Alternative, the Navy would not withdraw any federally administered public lands around the FRTC training ranges. Navy operations would continue on existing ranges. Public lands, including those identified as containing off-range ordnance, would remain under the authority of the current managing agencies. The No Action Alternative would be the least disruptive of the natural environment of the alternatives evaluated; therefore, it is considered the environmentally preferred alternative. However, the No Action Alternative would not be protective of the human environment, as discussed below, and would not satisfy the purpose and need of the proposed action.

  The No Action Alternative does not establish appropriate management responsibility for land containing off-range ordnance because the lands would not be under Navy control. It does not provide for the safety buffers defined through HAZARD modeling. The realism and flexibility of combat training activities would be severely limited under this alternative because visual cueing, integrated air and ground training, and close air support operations would be limited to existing Navy lands. This loss of realism would result in incomplete training of combat pilots, thereby increasing the potential for loss of lives in combat situations. The No Action Alternative does not meet the mission evaluation criteria; therefore it is not a reasonable alternative for purposes of this action. It is analyzed in this report to provide a baseline of current conditions as required by CEQ regulations (40 CFR 1502.11[d]).

2.2.3 Alternatives Not Considered in Detail

Four alternatives were eliminated from detailed study because they did not fulfill one or more of the evaluation criteria. Each alternative is presented below, along with a discussion on why it was not considered further. This analysis is consistent with CEQ regulations that require agencies to "rigorously explore and objectively evaluate all reasonable alternatives, and for all alternatives that were eliminated from detailed study, briefly discuss the reasons for their having been eliminated" (40 CFR 1502.14 [a]).

- ***Increase the Size of the Withdrawal.*** This alternative would withdraw over 200,000 acres of public land to include the widest safety buffer specified by the various studies, with the exception of land located on

Walker River Indian Reservation. It is not the Navy's intent to withdraw any more public land than is required to support the purpose and need of the withdrawal. While this withdrawal would fulfill the majority of training and safety requirements, it would not minimize the disruption of other public land users. For this reason, this alternative is not considered reasonable and is not analyzed in detail.

- *RAICUZ Withdrawal.* This alternative would withdraw 181,323 acres of public land, as recommended by the 1982 RAICUZ study. The 7,750 acres identified as containing off-range ordnance but not included in the 1982 RAICUZ footprint would not be withdrawn. This is not a reasonable alternative because the Navy would not withdraw ordnance-contaminated lands, as requested by the BLM. The BLM would have to continue managing the 7,750 acres containing off-range ordnance but not withdrawn under this alternative. In addition, it would not withdraw the land north of Highway 50 and B-17 or link the withdrawal lands in the Dixie Valley area to the Navy's Dixie Valley land holdings. Therefore, this alternative would not provide the most efficient use of the land for integrated air and ground training.

- *Off-range Ordnance Withdrawal.* This alternative would withdraw only the 24,464 acres of public land identified during the 1989 and 1990 sweeps as containing off-range ordnance (Figure 1-5). This alternative fulfills only part of one of the evaluation criteria objectives—close public access on lands containing off-range ordnance. It does not provide the safety buffers around the FRTC training ranges defined through HAZARD modeling (Figure 1-3). These buffers, which are based on operational requirements and parameters, are necessary to contain public safety hazards.

The Off-range Ordnance Alternative would not fulfill training-related criteria and would not provide the necessary land area for the Navy to change and improve realistic operational and strategic combat training. The modern Navy uses jets equipped with complex technologies including state-of-the-art weaponry and communication, navigation, and guidance systems. To operate these jets effectively and to maximize their performance in combat situations, pilots must have intense and realistic training under simulated conditions. Visual cueing devices, TACTS sites, and EW sites simulate enemy threat scenarios, counterattacks, and complex targeting scenarios. Under the Off-range Ordnance Alternative, EW sites would be allowed on existing Navy training ranges and off-range ordnance lands only. This would limit the Navy's flexibility to vary training combat scenarios and would therefore limit training capabilities at the ranges. The loss of realism in training caused by these restrictions would result in the incomplete training of combat pilots, thereby increasing the potential for loss of life in real world combat situations.

The Off-range Ordnance Alternative would not withdraw the land north of Highway 50 and B-17 or link the withdrawal lands in the Dixie Valley area to the Navy's Dixie Valley land holdings. This alternative would limit the ability of the Navy to provide effective integrated air and ground combat training. Integrated air and ground training is an increasingly important training component of the Navy and other branches of the military. Training in a variety of terrain is invaluable to this mission. Various types of lands are required for landing zones, for long-range patrols, and for simulating the terrain found in various real world scenarios.

This alternative would not give the NSAWC the flexibility to quickly respond to training needs because any proposed use on public lands under the authority of the BLM would have to go through BLM administrative processes. Additionally, the compatibility of land uses surrounding the ranges is an issue insofar as it affects the training missions and the viability of the FRTC.

This alternative would not provide the area and diversity required for effective training and does not meet DOD safety requirements and policies. Because this alternative does not meet the above requirements, it was not carried forward for detailed analysis.

- *Relocate All or Part of the FRTC.* This alternative would consist of relocating all or part of the existing ranges. The components of this alternative are: relocate the FRTC, close B-16, relocate B-16 operations to other regional ranges, and relocate B-16 operations to B-20. None of these options present reasonable alternatives to the proposed action, as discussed below.

Relocate the FRTC: Relocating the FRTC would involve identifying new or available existing airspace and identifying or constructing aircraft and personnel support facilities. New restricted airspace would have to be allocated by the FAA in order for the Navy to operate at a new location. Current FAA regulations require that all land under newly designated restricted airspace be owned by or be under the control of the user of the airspace if the user's operations require flights under 1,200 feet above ground level. NAS Fallon's restricted airspace covers approximately 2,000 square miles, or over 1.2 million acres, and NAS Fallon performs operations below 1,200 feet. This amount of land or more would therefore be required to relocate the FRTC. Figure 5-2 depicts the existing restricted and military operations area designated for NAS Fallon.

Establishing new restricted airspace for Navy operations would require the Navy to purchase or withdraw more land than is withdrawn at existing ranges. For example, relocating B-16 to a new range would require the Navy to purchase or withdraw at least 10 square miles of land for the training area and approximately 100 square miles of land for the restricted airspace, as required by FAA regulations. In addition, there are very few tracts of land this large available in the United States that would be compatible with military operations. The environmental impacts from relocation would be decidedly greater than the impacts from withdrawing land around the current ranges.

Neither Nellis AFB nor any other DOD facility has the available range and airspace capacity to accommodate the training mission of NAS Fallon. In addition, the ranges at Nellis AFB are test and evaluation (T&E) ranges that focus on research and development operations, while the FRTC is an operations and maintenance (O&M) combat training range facility. While some training may be conducted at T&E ranges, it is not a priority within the T&E mission, and the availability of combat training systems, targets, and resources is severely limited. In addition, the FRTC offers a unique configuration of land and airspace designations, allowing for types and levels of combat training not available elsewhere in the region. NAS Fallon has the airspace, weather, remoteness, training systems, ranges, and range impact areas necessary to conduct the required training operations.

NAS Fallon is the only regional facility capable of supporting the 1,500 to 2,000 personnel during the four-week CVW training. No other regional DOD facility has the available operational infrastructure, such as hangar and ramp space or maintenance facilities for F/A-18 aircraft. While additional facilities could be constructed at another installation, Congressional approval for funding would be required at a time when the political climate tends towards downsizing military facilities.

Relocating the FRTC does not offer a reasonable alternative to the proposed action. Establishing a new FRTC that could offer the same level of combat training is not viable because of the limited availability of large amounts of airspace and land, the potential for creating new environmental impacts, and the impracticability of creating new military installations. Relocating the FRTC to other regional ranges is not an option because regional ranges do not have the available airspace or support facilities to accommodate the amount or type of training activities performed at the FRTC. For these reasons, this alternative was eliminated from further consideration.

Close B-16: It was recommended during the public scoping process that B-16 be closed and training activities be relocated to other regional ranges because of noise and safety concerns. The Navy has rerouted 12 MTRs from B-16 and is proposing changes to the approach pattern to B-16, thereby reducing noise and safety concerns.

Closing B-16 without replacement is not a reasonable option because it would adversely affect the training mission of NAS Fallon. If it were possible to relocate training from B-16 to another training range at NAS Fallon, it would adversely affect the long-term viability and strategic importance of the FRTC and NAS Fallon The strategic importance of B-16 is described below:

- Most of the basic and intermediate training is performed at B-16, leaving the remaining NAS Fallon ranges available for advanced training.

- B-16 is the only range at NAS Fallon that is not used during a major air wing event and therefore is the only range available for other training events during these times.

- B-16 is used daily under current operating conditions. In 1994, over 1,500 basic air-to-ground practice/inert ordnance delivery sorties used B-16 (US Navy 1995c). B-16 has become increasingly important since TOPGUN and Top Dome relocated to NAS Fallon.

- In addition to servicing training functions at NAS Fallon, B-16 has a separate airspace that is used by other air training units from NAS Lemoore, California, NAS Cecil Field, Florida, NAS Whidbey Island, Washington, Marine Corps Air Station (MCAS) Yuma, Arizona, Nellis AFB, Nevada, MCAS Miramar, California, Mt. Home AFB, Idaho, Luke AFB, Arizona, and Hill AFB, Utah. Therefore, closing B-16 without replacement would affect training operations throughout the DOD.

- Under BRAC, many Navy air stations and Air Force bases are being closed or realigned. Consolidating those facilities makes NAS Fallon and the FRTC, which includes B-16, more strategically important for combat readiness training.

Relocate B-16 Operations to Other Regional Ranges: Moving B-16 operations to other regional ranges, such as Nellis AFB, does not meet the evaluation criteria and is not a reasonable alternative to the proposed action for the following reasons:

- Using B-16 for training minimizes en route travel time, thereby maximizing actual training time. Relocating B-16 operations would not promote efficiency or maximize training time.

- Other regional ranges also are reaching capacity because of military realignments under BRAC. Therefore, combat training time could not be guaranteed, preventing NAS Fallon from fulfilling its mission as a training facility.

- The ranges at Nellis AFB are T&E ranges that focus on research and development operations, while the FRTC is an O&M combat training range facility. While some training may be conducted at T&E ranges, it is not a priority within the T&E mission, and the availability of combat training systems, targets, and resources is severely limited.

- Using other ranges would not be cost-effective because additional fuel would be required for transit to the ranges.

- Relocating B-16 to a new range would require the Navy to purchase or withdraw at least 10 square miles of land for the training area and approximately 100 square miles of land for the restricted airspace, as required by FAA regulations.

Relocate B-16 Operations to B-20: Moving B-16 operations to an expanded B-20 range does not meet the evaluation criteria and is not a reasonable alternative to the proposed action for the following reasons:

- B-20 is commonly used concurrently with the FRTC airspace in major air wing and joint service training events. This limits its availability to the fleet replacement squadrons and the other DOD services for basic air-to-ground training.

- B-16 has completely separate airspace from the rest of the FRTC. When advanced combat training is taking place in the FRTC (using most or all of the FRTC airspace), B-16 can be used independently but concurrently for basic air-to-ground training.

- B-20 is comprised of alternating sections of private and public land. The Navy acquired the private land and in 1986 withdrew the public land. The approximately 21,500 acres of withdrawn public lands within B-20 could revert out of Navy control in 2001.

A summary matrix that compares each alternative considered to the evaluation criteria is presented in Table 2-2. The table is divided into two sections, "Alternatives that Meet the Evaluation Criteria" and "Alternatives that Do Not Meet the Selection Criteria."

2.3 USES AND CLASSIFICATION OF WITHDRAWN LAND

This section addresses the military activities that could take place on withdrawn lands under all action alternatives that were considered in detail. It also describes land use categories in which withdrawn land would be placed. The land use categories describe the public access conditions and reasonably foreseeable land management procedures on the lands that would promote multiple uses as appropriate with safety hazards.

2.3.1 Military Activities Common to All Action Alternatives

The purpose of Navy training at NAS Fallon is to present a coordinated integrated air wing training scenario representative of combat situations Navy personnel may face around the world. Realistic and strategic combat training requires using visual cueing devices, developing additional EW and TACTS sites, conducting integrated air and ground training operations, and continued use of chaff and flares. One purpose of the proposed land withdrawal is to provide the area necessary to accommodate these training activities. Each military activity as currently conducted is briefly discussed below. The majority of military use of the withdrawn lands would occur during the four to six air wing events that occur each year. Each air wing event lasts for four weeks, with one week of that training spent in the classroom. Types of training conducted and requirements supporting that training may change from time to time, reflecting changes in military technology developed by our forces as well as that of potential adversaries.

- **EW and TACTS Sites:** Up to five EW or TACTS sites would be developed on the withdrawn lands. Each EW site would occupy fewer than five acres, while each TACTS site would occupy less than one acre. Establishing five new EW or TACTS sites would bring the total number of such sites within the FRTC to 67. This includes the 62 sites already established through BLM rights-of-way. These 62 sites are in remote locations throughout central Nevada. The exact locations of the new sites have not been determined, but all would be within the withdrawn lands at B-17, B-19, and the Dixie Valley area where possible. Any military use that becomes necessary outside of the

TABLE 2-2
COMPARISON OF ALTERNATIVES TO EVALUATION CRITERIA

CRITERIA / ALTERNATIVES	NAS FALLON MISSION		PUBLIC SAFETY		
	Permits Realistic State-of-the-art Training Operations	**Allows for Integrated Air and Ground Training**	**Meets RAICUZ/ HAZARD Study Requirements**	**Withdraws All Lands Contaminated With Off-range Ordnance**	**Provides Multiple Use and Maximum Access on Public Lands**
ALTERNATIVES THAT MEET EVALUATION CRITERIA AND THE NO ACTION ALTERNATIVE					
Alternative I [189,080 acres]	Partially provides operational areas for modern training	Provides moderate training capabilities. Does not connect to existing Navy-owned land	Withdraws all land recommended in studies	Withdraws all land identified in BLM emergency closure	Allows for public use, except on off-range ordnance lands, HAZARD areas, and fenced EW sites where use is restricted
Alternative II (Preferred Alternative) [127,365 acres]	Provides operational areas for modern training	Connects Dixie Valley area to existing Navy-owned lands, providing training corridor	Withdraws identified land except where no longer required because of operational changes	Withdraws all land identified in BLM emergency closure	Allows for public use, except on off-range ordnance lands, HAZARD areas, and fenced EW sites where use is restricted. Smallest Dixie Valley footprint
Alternative III [152,765 acres]	Provides operational areas for modern training	Provides maximum training capabilities with corridor and large Dixie Valley area	Withdraws identified land except where no longer required because of operational changes	Withdraws all land identified in BLM emergency closure	Allows for public use, except on off-range ordnance lands, HAZARD areas, and fenced EW sites where use is restricted
No Action Alternative [0 acres]	Does not provide for realistic state-of-the-art operations	Does not provide improved training capabilities	Withdraws no land. Does not meet study requirements	Withdraws no land identified in BLM emergency closure	Off-range ordnance lands would remain closed to public use. Multiple use would remain on other lands
ALTERNATIVES THAT DO NOT MEET EVALUATION CRITERIA					
Increase the Size of the Withdrawal [200,000 acres]	Provides operational areas for modern training	Provides moderate training capabilities. Does not connect to existing Navy owned land	Withdraws all land recommended in studies	Withdraws all land identified in BLM emergency closure	Allows for public use but withdraws more land than required for operations
RAICUZ Withdrawal [181,323 acres]	Provides operational areas for modern training	Provides moderate training capabilities. Does not connect to existing Navy-owned land	Withdraws all land recommended in studies	Would not withdraw all off-range ordnance land identified in BLM emergency closure	Allows for public use, except on off-range ordnance lands, HAZARD areas, and EW sites where use is restricted
Off-range Ordnance Withdrawal [24,464]	Does not provide for realistic state-of-the-art operations	Does not provide improved training capabilities	Withdraws only off-range ordnance lands	Withdraws all land identified in BLM emergency closure	Off-range ordnance lands would remain closed to public use. Multiple use would remain on other lands
Relocate All or Part of the FRTC [0 acres]	May not allow state-of-the-art training since integrated training missions (e.g., CVWs) would most likely not be possible because of lack of large land tract/airspace	Relocation may not allow for adequate training capabilities since less land would be available at relocation site(s)	Relocation would transfer noise and safety issues to other area(s)	No off-range ordnance would exist at new sites. Existing off-range ordnance areas would remain closed pending the development of improved removal technology	Would close access and some uses on different areas of land. Existing range(s) would still be closed to the public because of ordnance contamination

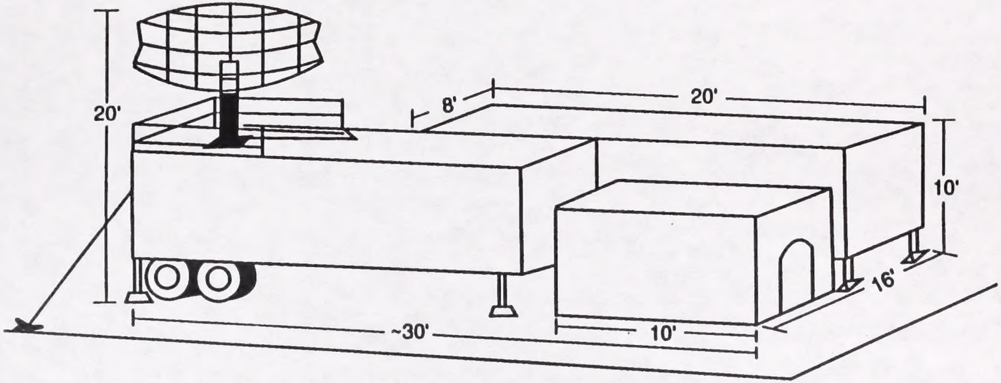
proposed withdrawal footprint would continue to be coordinated with the BLM or other appropriate agency. Existing access roads and utility corridors would continue to be used wherever possible. Most sites would be fenced for security, unless located in remote areas. The following briefly describes EW and TACTS sites:

EW Sites: The NAS Fallon EW sites represent a diversified complex of staffed and unstaffed multiple range radar systems that transmit search and tracking signals that simulate training scenarios (US Navy 1995b). Each EW site consists of one or more emitter units that can be employed to provide different presentations for different training scenarios. Equipment at each site may include height finder radars, search radars, a communications shelter, a microwave voice transmitter and data communications link, a maintenance van, a diesel aboveground storage tank, and a 200-kW or smaller generator. Equipment at these sites is powered by electric lines, with an emergency diesel generator as backup. Three to five personnel are stationed at each site for six-day periods.

Figure 2-2 depicts a staffed EW site. These sites occupy between one and five acres, with radar antennas extending as high as 50 feet. This specific radar is designed for long-range search and detection of tactical military aircraft conducting training in the Dixie Valley area. The control van simulates real-world radar emissions that could be experienced by aircrews on operational deployment outside the continental United States.

TACTS Remote Communication Relay Stations: TACTS is made up of a network of Tracking Instrumentation Subsystem (TIS) sites that provide real-time tracking weapons simulation and an electronic replay of the movements and performance of aircraft within the FRTC. This tracking is necessary to evaluate training practices and pilot performance and to provide increased aviation safety by increasing the ability to identify participating military aircraft locations throughout the FRTC.

The generic TACTS remote communication relay station equipment, shown in Figure 2-3, occupies a ground surface area of 25 feet by 25 feet. It consists of a solar panel, which provides electrical power to the system, and a relay station. The relay station operates in conjunction with an airborne aircraft pod and a distant TACTS master station. The remote relay receives and retransmits telemetry data about the aircrafts' geographic and vertical position, plus dynamic flight parameters to the TACTS master station. From this point, the data are transmitted to a central computer for processing, display, and evaluation.



NOTE: Dimensions are approximate

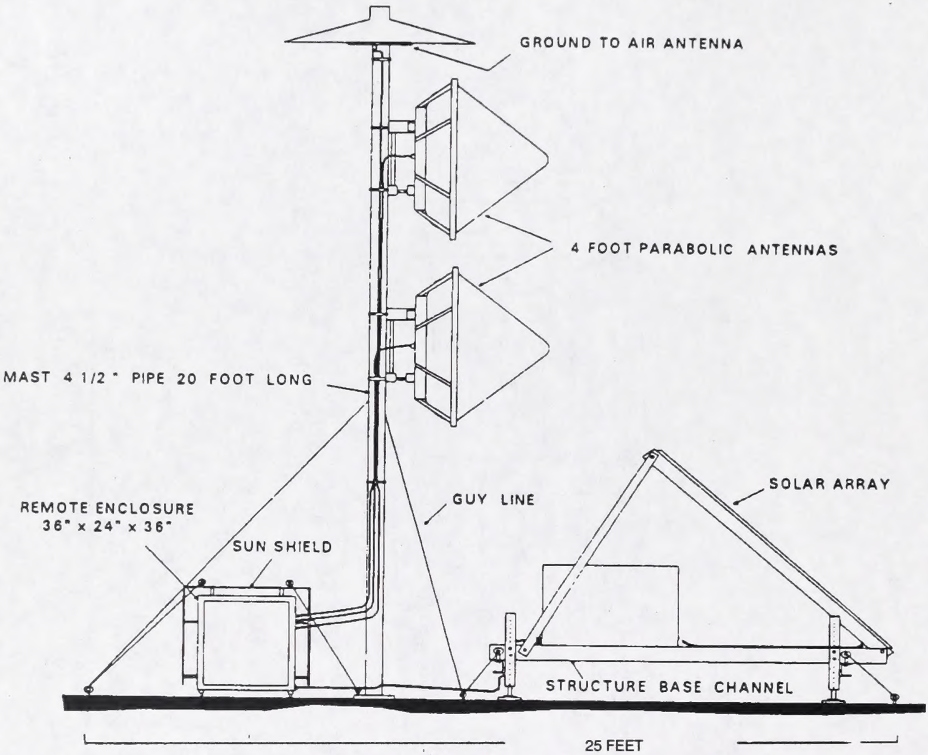
Up to five EW sites occupying no more than five acres each would be developed on proposed withdrawal land. EW sites are designed for long range search and detection of military aircraft.

Source: NAS Fallon

Typical Electronic Warfare Emitter Site

NAS Fallon, Nevada

Figure 2-2



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The TACTS sites occupy a ground surface area of 25 feet by 25 feet and transmit data to a central computer to determine aircraft position.

Typical TACTS Remote Communication Relay Station

NAS Fallon, Nevada

Figure 2-3

Source: NAS Fallon

- **Visual Cueing Devices:** Visual cueing devices provide combat strike pilots with a variety of necessary visual scenario challenges to enhance aircrew situational awareness. The aircrew's ability to sight and recognize ground threats is an essential element of overland air combat strike training. It is anticipated that up to 50 visual cueing device sites would be developed on the withdrawn lands. Not all the sites would be occupied at one time; typically, only three to six visual cueing devices are in use at a time during air wing training events. Each site would occupy no more than one acre and would consist of leveled land to provide a foundation for mobile passive and active cueing devices. Some sites may be developed with a concrete or gravel pad. None of the visual cueing device sites would contain permanent structures. The exact locations of the sites have not been determined, but most would be within the withdrawn lands at B-17, east of B-19, and in the Dixie Valley area. The proposed panhandle area considered under Alternatives II and III would provide additional flexibility in placing visual cueing devices, thereby enhancing realism. Existing access roads would continue to be used wherever possible. Following are brief descriptions of the active and passive cueing devices that could be placed on the sites.

  Active Visual Cueing Devices: The primary active visual cueing device that would be used is the "Smokey SAM," a 6-inch by 15-inch pyrotechnic-powered projectile constructed of formed paper used during CVW training. The projectile simulates the initial boost phase of a surface-to-air missile (SAM).

  The Smokey SAM projectile can attain a maximum altitude of approximately 1,500 feet above ground level and travels approximately 500 feet from the launch point. This visual cue enhances the realism of training for aircrews by simulating potential surface-to-air missile threats that may be encountered in real world combat situations. Active cueing devices would be moved from one site to another to increase realism. The Smokey SAM is and will be launched only on existing Navy-controlled ranges. The emptied cardboard cylinder, the only debris from the Smokey SAM, is picked up by the launching crew after each training cycle. Less than one percent of Smokey SAMs don't launch and there have been no documented safety problems.

  Another active visual cueing device that would be used on the withdrawn lands is the Imaging Weapons Training System (IWTS). This device, which is smaller than a jeep, transmits a target image to attacking aircraft. It gives pilots the capability to guide a simulated stand-off weapon to the ghost target using their cockpit weapons guidance systems.

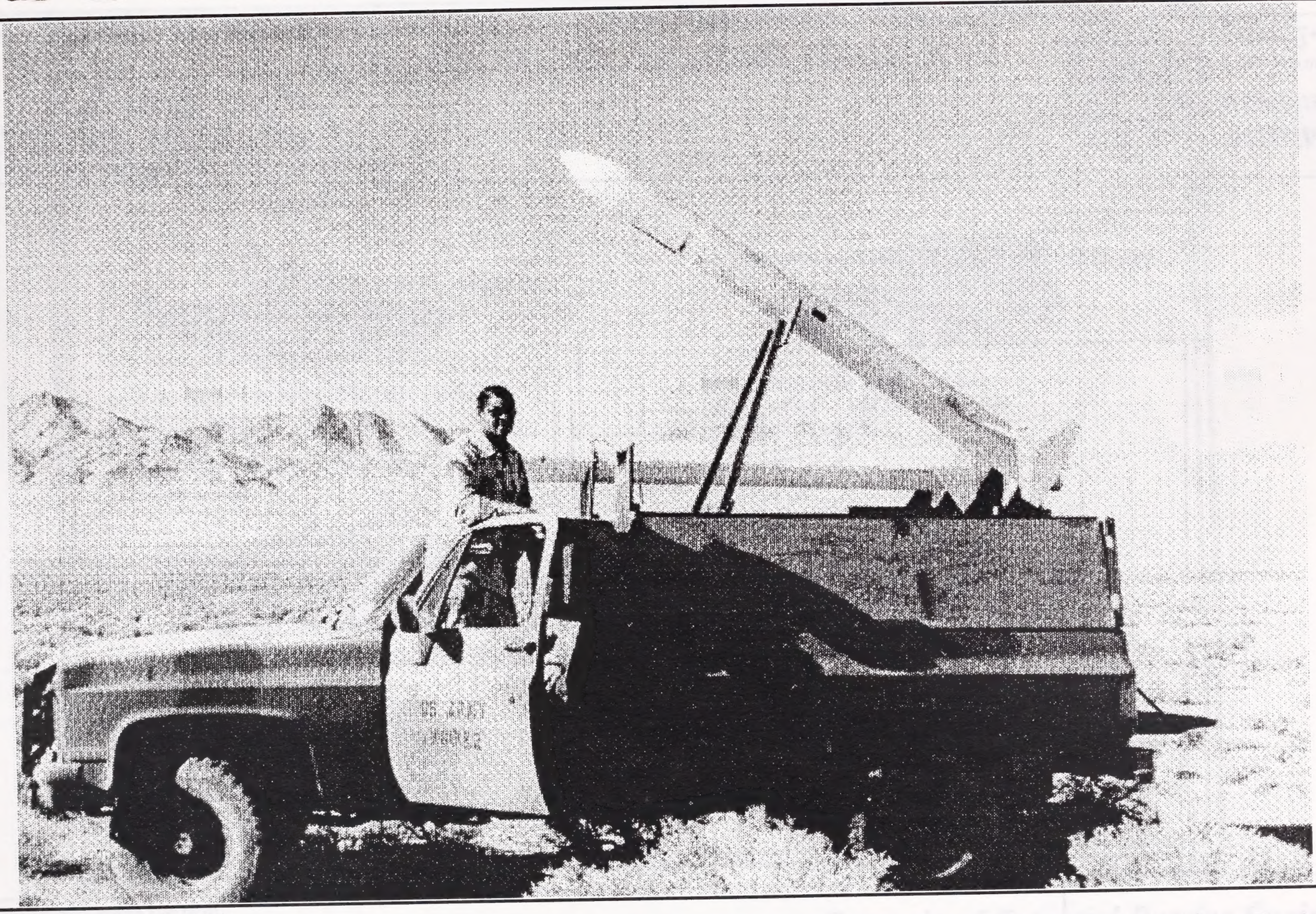
Passive Visual Cueing Devices: Figure 2-4 shows a mock mobile launch vehicle used as a passive visual cueing device. Inert SAM missiles are placed atop mobile launcher vehicles to train pilots to identify SAM batteries in threat environments. Each launcher vehicle is configured with three inert (simulated, nonexplosive/nonfiring) missiles for simulated training purposes (Figure 2-5). The launcher mount turns to point the missiles toward the aircraft being tracked by the missile radar system. Two launcher vehicles with missiles normally accompany the missile battery setup. No missiles are launched, as this is a passive cueing device only.

Other passive cueing devices that may be used on withdrawn lands include replicated or actual foreign mobile (vehicular) weapon systems, tanks, and personnel carriers. Different tanks that could be used as passive visual cueing devices are shown in Figure 2-6. These types of passive visual cueing devices would be temporary in terms of site location. The devices would be moved around to sites on a rotating basis to ensure a maximum change in threat scenarios. The devices would be driven to different locations, if operational, or more likely moved on trailers using existing roads and trails.

- **Ground Activities:** The Navy will use the withdrawn land for integrated air and ground training operations. Training in a variety of terrain is invaluable to the integrated air and ground training mission. Various types of land are required for drop and landing zones and for simulating the terrain that ground personnel may encounter in real world scenarios. The terrain of lands proposed for withdrawal would provide the area and diversity required for effective and realistic training.

  Table 2-3 details the amount and locations of integrated air and ground training that could occur on the proposed withdrawal lands; these numbers are not reflective of current training intensities but are included as a worst case scenario to evaluate the potentially greatest level of impact. The Navy would avoid public land users when conducting the ground portion of integrated air and ground training.

  As discussed in Section 1.2.1.2, most of the ground training is conducted on foot and is integrated with air support, including helicopter and fixed-wing operations. Special desert patrol vehicles, such as modified dune buggies, also may be used by ground personnel. These vehicles will be used only on existing roadways and trails and will be used alone or in pairs primarily during air wing deployments. Approximately 50 percent of the training occurs during the day and 50



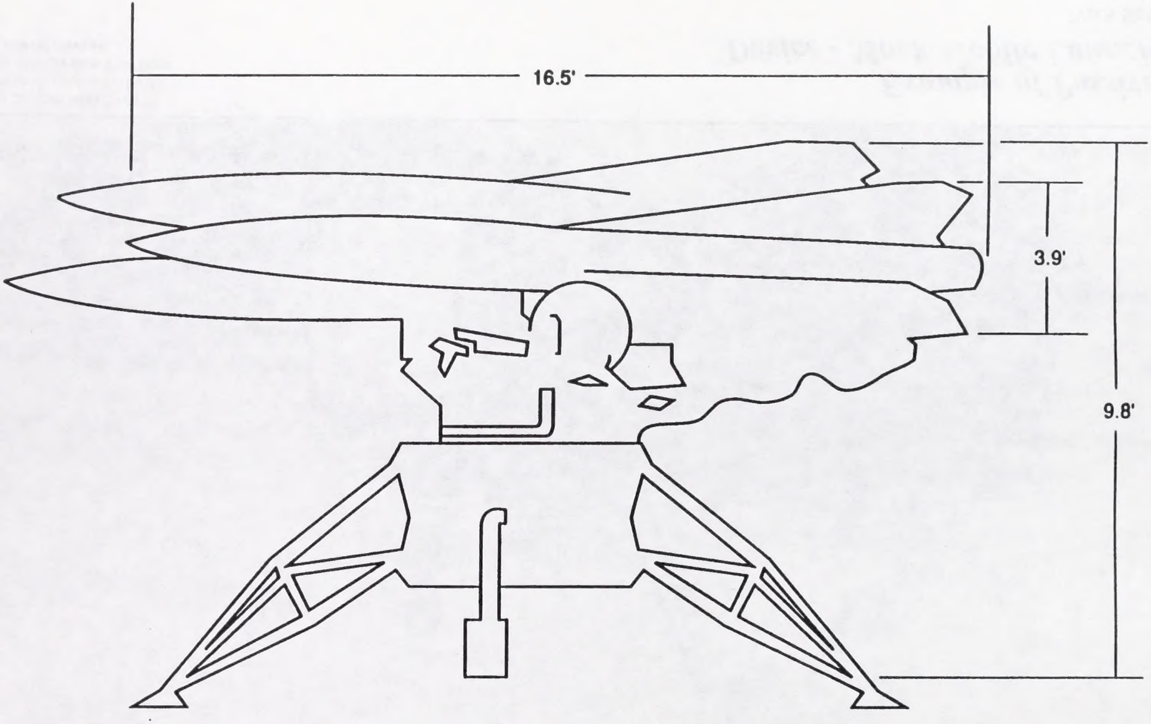
Passive cueing devices train pilots to identify surface-to-air missile batteries. No missiles are actually launched from these passive cueing devices.

Example of Passive Cueing Device - Mock Mobile Launch Vehicle

NAS Fallon, Nevada

Figure 2-4

Source: NAS Fallon



NOTE: Dimensions are approximate

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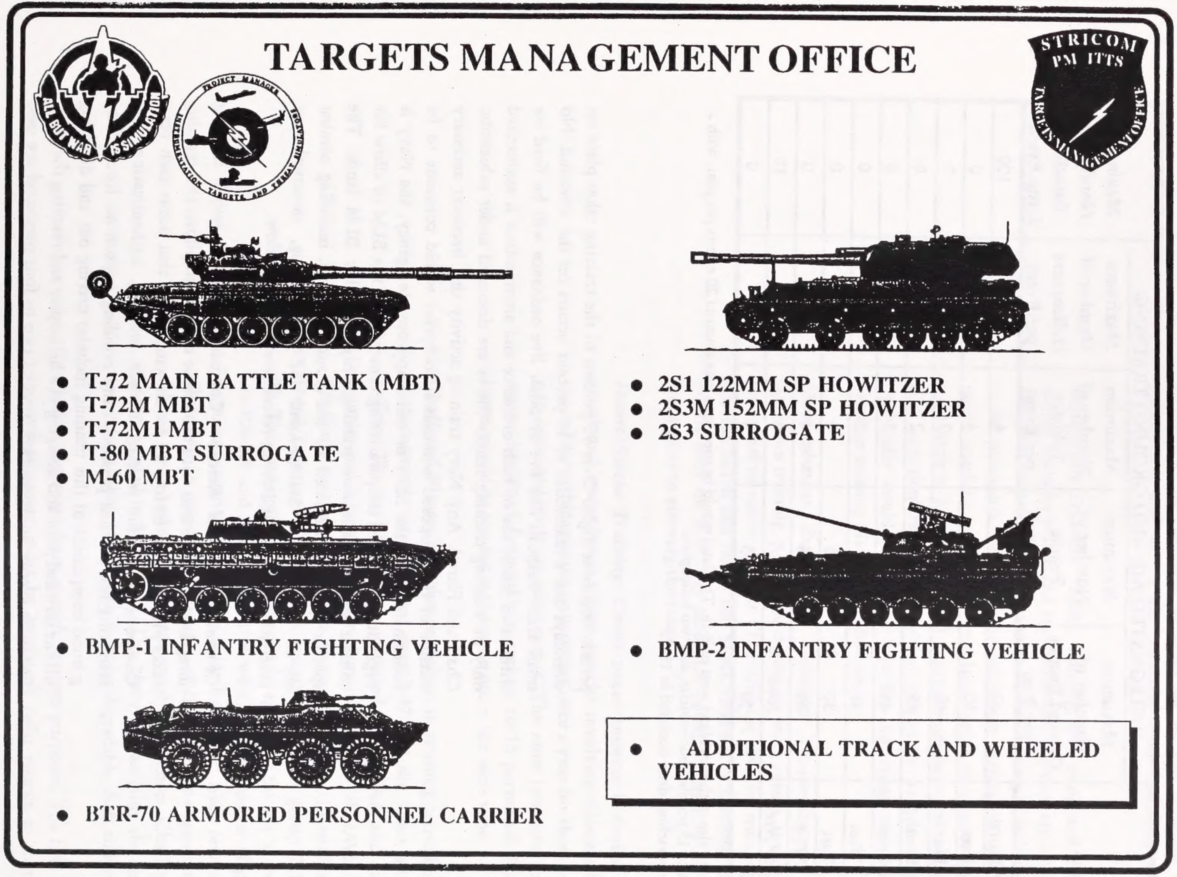
Although not actually launched during the training activities, these devices train pilots to identify ground based surface-to-air missiles.

Source: NAS Fallon

Inert Missiles on Launcher

NAS Fallon, Nevada

Figure 2-5



TARGETS MANAGEMENT OFFICE

- T-72 MAIN BATTLE TANK (MBT)
- T-72M MBT
- T-72M1 MBT
- T-80 MBT SURROGATE
- M-60 MBT

- 2S1 122MM SP HOWITZER
- 2S3M 152MM SP HOWITZER
- 2S3 SURROGATE

- BMP-1 INFANTRY FIGHTING VEHICLE

- BMP-2 INFANTRY FIGHTING VEHICLE

- BTR-70 ARMORED PERSONNEL CARRIER

- ADDITIONAL TRACK AND WHEELED VEHICLES

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Passive cueing devices train pilots to identify foreign military equipment. This equipment is used for site recognition purposes only.

Example of Potential Passive Cueing Devices - Foreign Mobile Systems

NAS Fallon, Nevada

Figure 2-6

Source: NAS Fallon

TABLE 2-3
INTEGRATED AIR AND GROUND TRAINING

Area		INTEGRATED AIR AND GROUND TRAINING				
		Maximum Number of Ground Events per Year	**Maximum Number of People per Event**	**Maximum Number of Vehicles per Event**	**Maximum Number of Helicopters per Event**	**Maximum Number of Parachute Drop Event[2]**
B-16[1]	North	30	15	4	2	100
	East	30	15	4	2	0
B-17	North	45	6	2	2	0
	South	45	6	2	2	0
	East	45	6	2	2	0
	West	45	6	2	2	0
B-19	East	30	15	4	2	0
	West	30	15	4	2	0
Dixie Valley Area		200	6	3	2	10
Shoal Site		20	15	4	2	0

[1] Alternative I also withdraws land west of B-16. This land would be used for a maximum of 20 events per year, with a maximum of 15 people, four vehicles, and two helicopters.

[2] Only one parachute drop occurred in 1997.

percent occurs at night. Over 90 percent of the training takes place on weekdays and a maximum of 10 percent occurs on the weekend. No small arms weapons live fire or other live ordnance will be fired on withdrawn lands; use of such ordnance and ammunition is authorized only on existing training ranges (flares are discussed under subsection Chaff and Flares). Any Navy training activity that becomes necessary outside of the proposed withdrawal footprint would continue to be coordinated with the BLM or other appropriate agency; the Navy is negotiating a limited cooperative agreement with the BLM to allow for combat search and rescue training only on other BLM lands. The specific types of integrated air and ground training, including combat search and rescue, Sea-Air-Land (SEAL) training, noncombatant evacuation training, and desert rescue, are discussed below.

Combat Search and Rescue: Combat search and rescue training integrates air operations with the rescue of downed pilots; this training takes place during the four to six air wing events that occur each year. Components of this training include locating, authenticating, and retrieving the downed personnel and avoiding opposition forces. The ground component of this training includes driving out and dropping off the downed pilot and bringing in a helicopter and rescuing the pilot. On some events, an opposition force of two to four personnel are used to try and capture the downed pilot. The typical ground training portion of the exercises involves up to two vehicles, up to two helicopters, and up to six personnel (not including two to four opposition forces).

SEAL Unit Training: SEAL training, also associated with air wing events, includes search and reconnaissance, forward air controllers, and navigational patrols. Components of the training include inserting four to six personnel via vehicle or helicopter, navigating, searching for a target, marking targets (on range lands only), and extracting personnel via vehicle or helicopter. SEAL units require large training areas so that they can prepare realistically for long-range patrols. The proposed panhandle would provide an area for long-range patrols by linking together existing Navy-controlled lands.

Noncombatant Evacuation Training: Noncombatant evacuation operation training, performed during air wing events, involves inserting personnel to rescue civilians. This training involves numbers similar to combat search and rescue and SEAL training. Currently, this training occurs only on B-17, but personnel could be inserted on withdrawn lands prior to entering the range.

Desert Rescue Training: Desert rescue training is similar to combat search and rescue but is a joint exercise involving different branches of the military; this training now occurs once a year for three weeks and is not associated with air wing events. The most intensive desert rescue event consists of four vehicles and up to 15 personnel. Not all these forces would be located at the same site at the same time.

- **Chaff and Flares:** To enhance realism in training activities, chaff and flares currently are deployed over B-17 and the Dixie and Fairview Valleys. The use of chaff is authorized by the FAA and other federal agencies and is regulated under Navy instruction OPNAVINST 3430.9. Chaff use on the NAS Fallon ranges is authorized specifically by the Naval Emissions Center in its message, date-time group 011715Z SEP 95. The two types of chaff currently approved for use at NAS Fallon are RR-129 and RR-144, both of which are composed of glass fibers, aluminum coating, and stearic acid. Each chaff fiber resembles a fine silver hair. A canister, or bundle, of chaff contains approximately 2.1 million fibers and weighs approximately 1.5 ounces. Chaff is discussed in more detail in Section 4.2. The Navy is examining the feasibility of using degradable chaff, which includes degradable chaff and end caps.

  Chaff is dispensed from aircraft for two purposes. The first purpose is to confuse enemy radar by saturating radar signals so that the radar cannot distinguish between the aircraft and the dispensed chaff. The second purpose is to act as a decoy to enemy missiles, causing them to follow the chaff cloud rather than the aircraft. Chaff is dispensed from an aircraft in bundles that disperse to form a cloud behind the aircraft. The cloud, which may be 300 to 600 feet in diameter, reflects radar signals and obscures the aircraft; the cloud is not visible to the naked eye. Chaff settles at an estimated fall rate of 50 feet per minute or less. Initial chaff concentrations are about 120 micrograms per cubic meter, but dissipate quickly because of chaff's lightweight and the effects of wind and air currents. As a result, extremely wide dispersion patterns are produced (US Air Force 1996). Occasionally chaff bundles do not disperse completely and clumps of chaff may be found. Chaff has been used in a portion of the FRTC for over 30 years and NAS Fallon uses approximately 2,350 bundles of burst chaff per month, or 28,000 bundles per year (SAIC 1991).

Chaff deployment would continue over B-17 and the Dixie and Fairview Valleys within the Gabbs North MOA and Gabbs Central MOA, limited to the west near the Stillwater Mountain Range. The potentially affected area encompasses approximately 4,220 square miles. The total approximate weight of chaff that would continued to be dropped per year would be 7,500 pounds, less than two pounds per square mile or 0.0028 pounds per acre.

The Navy took the initiative to study chaff in the Dixie Valley area to determine the concentration of chaff on the ground in areas under which chaff is deployed. The survey, conducted in 1994 and 1995, detected chaff fibers, parts of chaff bundles, and debris on the ground within portions of the Dixie Valley area. In a survey that covered approximately 0.14 percent of the Dixie Valley area, the most commonly found debris included the caps that come off the end of chaff bundles when chaff is released. One intact chaff bundle was found. Chaff debris was found most frequently near Dixie Valley Road in the eastern portion of the Dixie Valley area (US Navy 1995a).

Decoy flares are magnesium pellets that burn for less than 10 seconds at 2,000 degrees Fahrenheit. The burn temperature is hotter than the exhaust of an aircraft and therefore attracts heat-seeking weapons targeted on the aircraft (SAIC 1991). Approximately 120 decoy flares are dropped each month.

Parachute training flares are dropped over the training ranges but may occasionally be found off-range. Parachute flares are used infrequently; currently, approximately 60 parachute flares are dropped per year.

Beginning in 1989, the Navy organized recurring helicopter, vehicle, and foot traffic sweeps at a minimum of two per year of areas adjacent to ranges to remove any ordnance and flares. These sweeps and reconnaissances are coordinated with the BLM and Nevada State Division of Environmental Protection as outlined in a memorandum of agreement regarding off-range military ordnance. This memorandum of agreement was developed by the Navy, BLM, and the State of Nevada in 1989 to minimize risks to the public from off-range ordnance. This agreement was updated in December 1995 (US Navy 1995j). In 1989 and 1990, off-range sweeps of the ranges discovered 406 unspent flares in the off-range ordnance areas. It was concluded from these sweeps that approximately 20 flares per year accumulate in off-range ordnance areas (SAIC 1991). All unspent ordnance and flares are rendered safe at the site location.

2.3.2 Land Use Categories

The withdrawn land would be distributed into one of two land use categories: Category A—Exclusive Navy Use, Potential Ordnance Hazard, or Category B—Navy and Public Use, Limited Land Use Conflicts. This distribution is based on the same operational conditions and needs and safety considerations that led to the withdrawal proposal. For each proposed land use category, public access and reasonably foreseeable land management procedures are described. The land use categories, along with the access characteristics, land use implications, and management procedures for each, are discussed below. The breakdown of the withdrawal area into land management categories for each alternative is described in Section 2.3.3.

Pursuant to federal regulations regarding the management of withdrawn land, the Navy has developed a resource management plan in consultation with the BLM, BUREC, and DOE. This plan provides specific land use policies for the withdrawn lands, based on the public uses and land management procedures described here. The management and adjudication procedures for the withdrawn land will be defined by agreement between the Navy, BLM, BUREC, and DOE. The resource management plan for withdrawn lands is summarized below and provided in Appendix J.

2.3.2.1 Category A—Exclusive Navy Use, Potential Ordnance Hazard

Category A lands are the 40,280 acres of land identified by off-range ordnance sweeps and training range HAZARD modeling as containing, or having the potential to contain, off-range ordnance. Based on present technologies, 100 percent "sanitation" of these lands cannot be guaranteed since surface and subsurface ordnance may remain undetected in sweeps (Figure 1-5). The BLM has determined that public access is not appropriate on lands identified as containing off-range ordnance. Given the limited nature of ground training activities, the experience of Navy personnel in identifying, avoiding, or handling off-range ordnance, and annual sweeps of off-range ordnance areas, integrated air and ground training may be conducted on these lands.

Lands designated for this category lie east of B-16; north, south, and east of B-17; and north and east of B-19. The Navy will manage Category A lands and public uses will be closed. Designation of Category A lands will not change or expand actual impact areas within the ranges. The purpose of Category A lands is to enhance public safety by segregating lands where ordnance has been found through range sweeps and by identifying potential ordnance impact areas associated with air-to-ground training.

Public Access/Recreation. Public access to Category A lands would not be permitted. All public access would be denied for safety reasons by fencing existing access roads and by posting signs. No recreational uses, organized or otherwise, would be permitted. Public access currently is closed on 24,464 acres of land containing off-range ordnance under a BLM emergency closure action.

Future Development/Structures. Category A lands would be closed to future public development. Any Navy-proposed development would be subject to all environmental laws and regulations, including NEPA and guidelines of NAS Fallon's Cultural Resource Management Plan (CRMP). Non-Navy agency proposals, such as wildlife guzzlers, would be addressed on a case-by-case basis.

Livestock Grazing. No grazing would be permitted on Category A lands. Existing permits would be revoked after the land was withdrawn. The Navy will explore means to compensate holders of permits on Category A lands, subject to Congressional authorization and appropriation.

Mining. Category A lands would be closed to all mining and mineral exploration including locatable, leasable, and saleable minerals. Mining new or existing claims would not be allowed. No leasing or development of salable minerals would be permitted on Category A lands. The Navy will explore means to compensate holders of impacted patented claims and valid unpatented claims, subject to Congressional authorization and appropriation.

Cultural Resources/Natural Resources. No field investigations for cultural or natural resources would be allowed on Category A lands unless an ordnance sweep could be completed prior to field work. NAS Fallon maintains a CRMP and a programmatic agreement (PA) with the Advisory

Council on Historic Preservation (ACHP) and the Nevada State Historic Preservation Officer (SHPO) that describes compliance requirements for the Navy's management of cultural resources, including Section 106 of the National Historic Preservation Act (NHPA). The PA has been signed by the Commanding Officer of NAS Fallon, the SHPO, and the ACHP. Navy actions will undergo the appropriate NHPA Section 106 review and consultation for cultural resources and Endangered Species Act (ESA) Section 7 review and consultation for biological resources.

In developing the resource management plan, NAS Fallon would use the Carson Desert predictive model to determine the potential for cultural resources on withdrawal lands. The Navy would attempt to avoid those areas potentially containing cultural resources when siting military equipment and when conducting air and ground training operations. Where areas cannot be avoided, appropriate consultation and mitigation will be undertaken.

Wilderness. There are no wilderness study areas or wilderness areas within the lands designated as Category A.

Water Access and Developments. Access to existing water developments and new water developments generally would not be allowed on Category A lands. Existing water developments include one guzzler and three watering troughs. As laid out in a cooperative agreement between the Navy and BLM, the Navy will provide BLM access for maintaining the guzzler (US Navy 1994a). The Navy will explore means to compensate holders of water rights on Category A lands, subject to Congressional authorization and appropriation.

Leases, Easements, Utility Corridors, and Rights-of-way. Existing nonmilitary uses on Category A lands, such as for utility corridors, would be managed by the Navy. Limited proposed land uses, such as guzzlers, would be considered on a case-by-case basis.

2.3.2.2 *Category B—Navy and Public Use, Limited Land Use Conflicts*

Between 87,085 and 148,800 acres of the land withdrawn, depending on the alternative, would be classified as Category B. The Category B designation would allow the Navy to meet its major training requirements, including integrated air and ground training and siting of EW, TACTS, and visual cueing device sites while still allowing for public use and access.

The BLM would manage Category B lands with Navy review and approval. Any new activities on Category B lands would be subject to the requirements laid out in the resource management plan (Appendix J). To ensure public safety and meet training requirements, the Navy would retain the right to review and approve activities, such as site development and organized recreation actions. The BLM Carson City District is concerned that it may not be able to adequately manage Category B lands and is therefore considering the potential need for the Navy to manage the lands. If the Navy were to manage Category B lands instead of the BLM, the Navy would work with the BLM to develop management programs similar to those of the BLM to allow for continued public use of Category B lands, including recreation and grazing.

Although Category B lands would retain present access characteristics for public use, some controls would be applied if the activity affected operations or safety; these controls include limiting the height of structures in run-in line approach areas and prohibiting patenting of lands. Except for fenced EW sites, Category B lands would remain open to public uses. The Navy would conduct integrated air and ground training activities, such as combat search and rescue , on some Category B lands. The Navy will avoid other public land users when conducting ground operations.

EW, TACTS, and portable visual cueing devices also would continue to be placed within these lands. The Navy foresees the possible need for developing approximately five EW or TACTS sites, and up to 50 active and passive visual cueing device sites on withdrawn lands. The EW sites would require one to five acres per site, and the TACTS sites would require up to one acre per site, not including road, power, and other utility requirements. EW sites near areas of public use would be fenced. Existing access roads and utility corridors would continue to be used wherever possible. Visual cueing device sites would require no more than one acre. Not all visual cueing device sites would be occupied at one time (i.e., there would never be 50 visual cueing devices on the withdrawn lands at one time). Some sites, particularly visual cueing device installations, could be closed, reopened, and relocated over time. The specific locations to be proposed for EW, TACTS, and visual cueing device sites have yet to be selected, but all would be within withdrawn lands at B-17, B-19, and the Dixie Valley area, where possible.

Current management practices for resources, including recreation, grazing, and mining, would continue on Category B lands. For activities currently requiring permits, such as site development and organized recreational events, the Navy would review and have the authority to approve actions that are in conformance with public safety or Navy training activities. For activities not requiring permits, the Navy would be notified of known activities to avoid conflict between Navy and public users. Management practices for each resource area are detailed below.

Public Access and Recreation. Any organized activities currently subject to BLM, BUREC, or DOE permitting procedures, such as off-road vehicle races, also would require Navy approval. Proposed Navy EW and TACTS sites would not be fenced if they are in remote locations but would be fenced in more accessible areas. EW, TACTS, and visual cueing device sites would not be chosen if they contain existing mining claims or ROWs. Should access to fenced areas be requested, Navy approval would be required. Organized recreational activities, such as off-road vehicle races, would not be permitted on developed sites. Abandoned sites would become available for organized recreational activity, in accordance with the surrounding land management categories.

Future Development/Structures. Category B lands are included in the proposed withdrawal primarily as a means for the Navy to provide training scenarios and to ensure operational safety. New developments would be subject to the requirements of the resource management plan. The Navy would obtain the right to approve new or modified developments. New structures or modifications to existing structures generally would be subject to a height limitation of 50 feet, though individual proposals such as those related to existing rights-of-way and utility corridors would be reviewed on a case-by-case basis. The Navy could waive height limits in cases where exceeding 50 feet is necessary for a short-term development, such as for an oil well, or where such a waiver does not pose a safety hazard to aircrew. Permanent nonconforming structures also could be allowed in some areas if, in the judgment of the Navy, such structures were compatible with Navy training uses.

Livestock Grazing. Livestock grazing on Category B lands would continue to be managed under current applicable laws, including the Taylor Grazing Act of 1934, the FLPMA of 1976, and the Public Rangelands Improvement Act of 1978. Grazing would continue, and existing grazing permits would be unchanged by withdrawal enactment. There would be no access restrictions to existing cow camps and range improvements. The renewal of grazing permits would continue to be handled by the BLM. BLM range improvement permits would be subject to Navy review and approval. Were the Navy to manage the Category B lands, current Navy programs for managing grazing would be implemented.

Livestock grazing on EW, TACTS, and visual cueing device sites would continue to be managed in accordance with current applicable laws. Grazing could continue on unfenced developed sites, but cattle would be excluded from fenced sites. Cow camps or other range improvements would be avoided when establishing developed sites. Since most developed sites would be small, generally less than one acre, restricting on-site grazing is not expected to affect forage availability or the value of grazing allotments.

Mining. Mining would be permitted on most Category B lands under existing mining laws (Mining Act of 1872, Mineral Lands Leasing Act of 1920, as amended, Mineral Lands Act for Acquired Lands of 1947, and Geothermal Steam Act of 1970). These lands would be open for mineral exploration, for working existing patented and unpatented claims, and for staking new claims. The proposed withdrawal would preclude patenting of unpatented mining claims because patenting gives the claimant absolute title to the land; such title would not allow the Navy to monitor for incompatible land uses. Operations on claims (including leasable and salable materials) on Category B lands would continue to be managed through the standard issue of permits, leases, plans of operations, licenses, contracts, and grants. The Navy would have final approval authority for any permits to ensure compatibility with Navy usage. For example, mining developments may not be authorized if they are within aircraft run-in lines and proposed structures taller than 50 feet.

Existing valid mining claims and areas of known mineralization would be avoided in the development of Navy EW, TACTS, and visual cueing device sites. No mineral leases or sales would be authorized during site development or use by the Navy. No exploration or operations would be permitted within fenced EW and TACTS sites during their development or use. Unfenced sites could be explored, but mining operations could not take place. Abandoned sites would revert to Category B status and would be subject to Category B land use policies. Existing access and utility corridors for EW and TACTS sites would be available for mining exploration, subject to BLM regulations and Category B land use policies.

Cultural Resources/Natural Resources. Cultural resources would be managed according to the NAS Fallon CRMP and the PA with the Advisory Council and SHPO for Navy actions. The BLM would be responsible for cultural resource protection for non-Navy actions. Cultural and natural resources would continue to be afforded protection under applicable legislation and regulations. As with Category A lands, the Navy will identify the lands potentially containing cultural resources using the Carson Desert predictive model.

Natural resources, including soils, flora, and fauna, on EW, TACTS, and visual cueing device sites would be subject to identification, analysis, and impact mitigation, as required by various federal environmental laws and regulations. Site investigations and, where appropriate, mitigation plans will be completed prior to development. These areas would be available for field investigations until developed Navy sites are fenced.

Wilderness. Alternatives I and III evaluated in this FEIS include a portion of the Job Peak WSA in the withdrawal footprint. The Navy has no plans for

Category B lands that would impair the wilderness characteristics of lands in the Job Peak WSA. Public access to these lands would not be closed. If Job Peak is designated by Congress to be a wilderness area, it would be removed from any alternatives that propose it for withdrawal. The Navy has no plans for EW, TACTS, or visual cueing device site development in the WSA.

Water Access and Developments. The Navy would be notified and given the opportunity to review and approve new water developments on Category B lands, such as for cattle range improvements.

Establishing EW, TACTS, and visual cueing device sites would have no impact on existing or future water developments or water rights. Existing water developments would be avoided in site selection. Site selection also would avoid areas that could restrict future access to water or in any other way affect water rights. No water development would be permitted on fenced EW or TACTS sites during the term of its use.

Leases, Easements, and Rights-of-way. The BLM would be responsible for issuing new leases, easements, and ROWs, or any other authorization with respect to the nonmilitary use of Category B lands. Navy opportunity to review and approve proposals is required to assess land use compatibility. Rights as established by existing ROWs, such as utility corridors, would not change. Future development of structures over 50 feet in height generally would be restricted. Grants or issuance of new ROWs may contain this height restriction for all structures including, but not limited to, transmission lines.

2.3.2.3 *Land Use Summary*

The Navy would manage Category A lands, and public access would be closed. Category B lands would be managed by the BLM and coordinated with BUREC and DOE where appropriate. Navy opportunity to review and approve proposals would be required to assess land use compatibility. Table 2-4 provides a summary of access characteristics, land use implications, and management procedures for each category.

2.3.3 Land Use Categories by Alternative

This section describes how the land proposed for withdrawal under each alternative would be categorized for public access and use (Category A or B) and the reasons for withdrawing each area (Table 2-5). All Category A lands would be closed due to ordnance hazards or due to potential public safety risks as defined in HAZARD modeling (see Figure 1-3). Although practice/inert ordnance may contain spotting charges, the Navy does not

TABLE 2-4
SUMMARY OF LAND USE CATEGORY CONTROLS

	Category A-Exclusive Navy Use: Potential Ordnance Hazard	**Category B-Navy and Public Use: Limited Land Use Conflicts**
General Land Management Description	Closes land to public use because of safety concerns. Includes land identified as containing, or potentially containing, off-range ordnance.	Least restrictive land use. Would maintain multiple land uses with few regulations. Most lands fall into this category and would be managed by the BLM with Navy review and approval.
Public Access; Recreational Use	Closed to access to protect public safety.	Public access, recreational use not controlled. Organized events are subject to existing laws and must receive Navy approval. EW sites generally would be closed to the public except for remote sites.
Future Development/ Structures	None allowed; exceptions require Navy review and approval.	Navy: NEPA compliance. Non-Navy: NEPA and BLM regulations and Navy review; 50′ height limit on new or modified structures.
Mining *Exploration*	No new exploration permitted.	Regulated under existing laws with Navy review and approval of mining developments. Developed Navy sites closed to exploration during period of use. Open to public once site is abandoned.
Mining *Existing Claims*	No mining activity would be permitted because of safety hazards to miners from ordnance.	Claims access and operations regulated by BLM with Navy review and approval of mining developments. Developed Navy sites would avoid existing claims.
Mining *New Claims*	No new claims permitted.	Regulated under existing mining laws with Navy review and approval of mining developments. The proposed withdrawal would preclude patenting of unpatented mining claims.
Leasable/Salable Minerals	No new leases, sales, developments; exceptions would be considered on a case-by-case basis with Navy review and approval.	BLM issues leases, permits, licenses, contracts, and grants with Navy review and approval. No new leases would be permitted once developed Navy site was proposed or in use. Leases allowed once site is abandoned.
Grazing	No grazing would be allowed on Category A lands because of existing and potential off-range ordnance hazards.	The BLM will continue to administer permits and to regulate activities under existing with Navy review and approval of range improvements. Use and maintenance of existing range improvements and cow camps permitted. Grazing permitted on unfenced developed Navy sites but excluded from fenced sites.
Cultural/ Natural Resources	Field investigations generally not allowed unless preceded by ordnance sweep; CRMP and PA describe compliance requirements (such as Section 106) for cultural resources.	Navy responsible for Section 106 and Section 7, as applicable for Navy actions; BLM responsible for Section 106 and Section 7, as applicable for non-Navy actions.
Wilderness	No Category A lands are designated as Wilderness Areas or Wilderness Study Areas.	Navy has no plans that would affect wilderness designation of Job Peak. Navy will delete Job Peak WSA from withdrawal request if it is designated a wilderness area. Developed Navy sites would avoid WSA.
Water Access and Developments	New water developments and access to existing water developments would not be allowed on Category A lands to anyone other than BLM.	Navy to review and approve new water development proposals. New development restricted on developed Navy sites during period of use.
Leases, Easements, Rights-of-way	Existing nonmilitary uses, such as utility corridors, managed by the Navy. Limited proposed land uses, such as guzzlers, considered on a case-by-case basis.	BLM issues with Navy review and approval required to avoid incompatible land uses. Existing utility corridors and rights-of-way subject to existing rights.

TABLE 2-5
PURPOSE AND USES OF WITHDRAWAL AREAS[1]

Range	Land Area[2] (acres) Alt I/Alt II/Alt III	Land Use Category	Purpose and Use of Withdrawal Alternative I	Purpose and Use of Withdrawal Alternative II	Purpose and Use of Withdrawal Alternative III
B-16 North	27,225/ 6,160/ 6,160	B	RAICUZ, practice/inert off-range ordnance, armed overflight, integrated air and ground training	Integrated air and ground training, practice/inert off-range ordnance	Integrated air and ground training, practice/inert off-range ordnance
B-16 East	640	A	RAICUZ, practice/inert off-range ordnance, integrated air and ground training	HAZARD footprint, practice/inert off-range ordnance, integrated air and ground training	HAZARD footprint, practice/inert off-range ordnance, integrated air and ground training
	3,600	B	RAICUZ, integrated air and ground training	Integrated air and ground training	Integrated air and ground training
B-16 West	2,560/ 0/ 0	B	RAICUZ, integrated air and ground training	Not included in withdrawal area	Not included in withdrawal area
B-17	33,400	A	RAICUZ, off-range ordnance, armed overflight, EW/visual cueing, integrated air and ground training	HAZARD footprint, off-range ordnance, EW/visual cueing, integrated air and ground training	HAZARD footprint, off-range ordnance, EW/visual cueing, integrated air and ground training
	2,495/ 0/ 0	B	RAICUZ, EW/visual cueing, integrated air and ground training	Not included in withdrawal area	Not included in withdrawal area
B-19 North/East	6,240	A	RAICUZ, off-range ordnance, armed overflight, EW/visual cueing, integrated air and ground training	Off-range ordnance, HAZARD footprint, integrated air and ground training, EW/visual cueing	Off-range ordnance, HAZARD footprint, integrated air and ground training, EW/visual cueing
	5,760/ 5,120/ 5,120	B	RAICUZ, armed overflight, EW/visual cueing, integrated air and ground training	Integrated air and ground training, EW/visual cueing	Integrated air and ground training, EW/visual cueing
B-19 West	7,080/ 840/ 840	B	RAICUZ, EW/visual cueing, armed overflight, integrated air and ground training	Integrated air and ground training	Integrated air and ground training
Shoal Site	7,405/ 2,765/ 2,765	B	Integrated air and ground training	Integrated air and ground training	Integrated air and ground training
Dixie Valley Area	92,675/ 62,500/ 87,900	B	EW/TACTS/visual cueing, integrated air and ground training	EW/TACTS/visual cueing, integrated air and ground training	EW/TACTS/visual cueing, integrated air and ground training
Panhandle	0/ 6,100/ 6,100	B	Not included in withdrawal area	Integrated air and ground training, EW/TACTS/ visual cueing, connect to Navy land holdings in Dixie Valley	Integrated air and ground training, EW/TACTS/ visual cueing, connect to Navy land holdings in Dixie Valley

[1] See Figures 2-7 through 2-9 for a depiction of the land withdrawal areas by land use category.

[2] When one acreage figure is provided, the acreage is the same under all alternatives.

consider practice/inert ordnance located north of B-16 to be a public safety hazard because of the low risk of occurrence and low probability of harm from exposure. Therefore, these lands would be managed under Category B status.

2.3.3.1 Alternative I

This alternative would withdraw approximately 189,080 acres of public land (Figure 2-7). Table 2-5 details the reasons for withdrawing each area. The lands proposed for withdrawal would be categorized as follows:

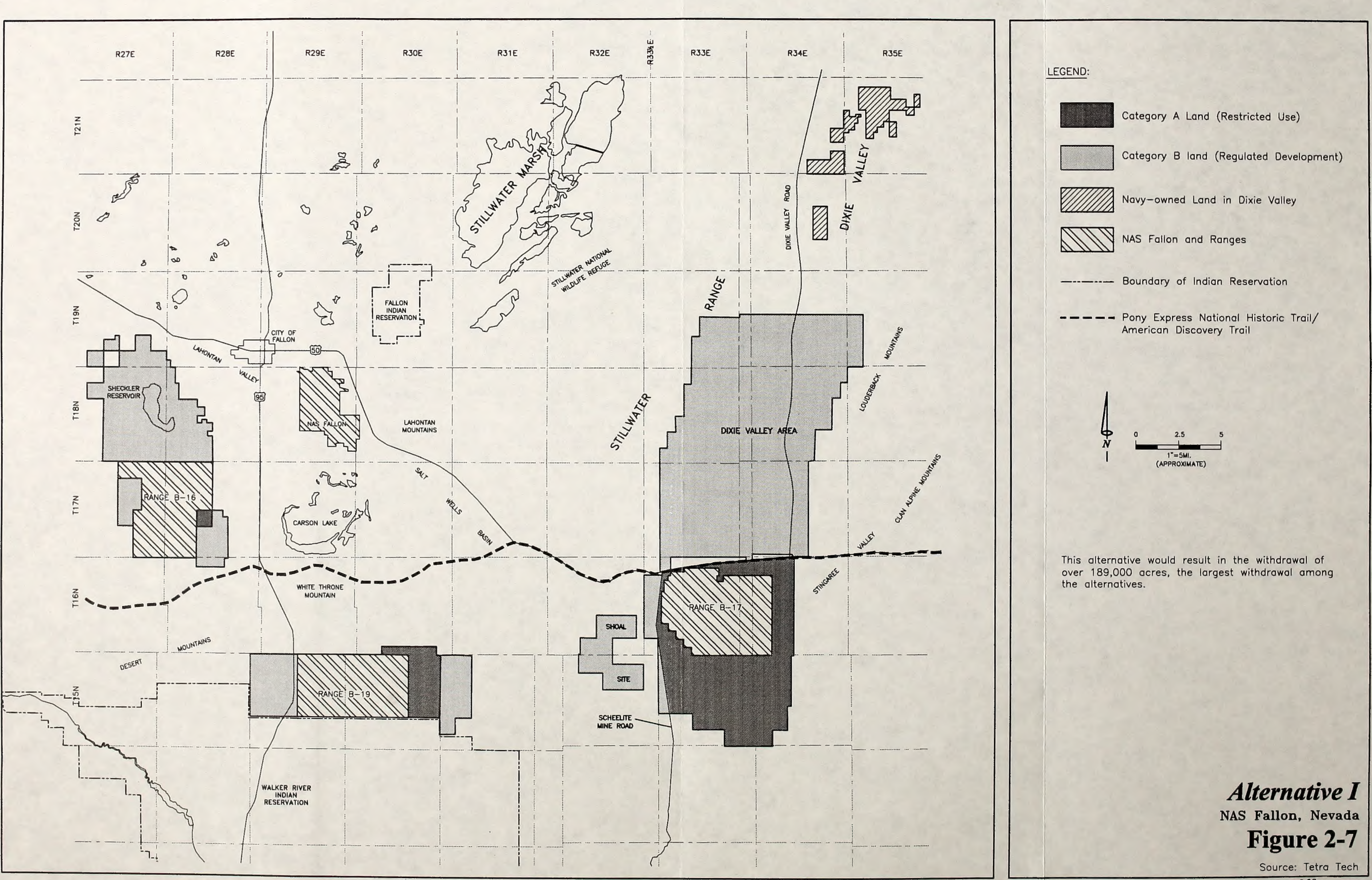
- Bravo-16—34,025 acres located north, west, and southeast of the range are proposed for withdrawal. Of these, 640 acres east of B-16 would be managed under land use Category A. The remaining withdrawal land around B-16 would be managed under land use Category B. These lands provide a safety and armed overflight buffer and integrated air and ground training areas.

- Bravo-17—35,895 acres located primarily south of the range are proposed for withdrawal. Of these lands, 33,400 acres would be managed under land use Category A. These lands provide a safety buffer and integrated air and ground training areas and allow for placement of EW, TACTS, visual cueing device sites.

- Bravo-19—19,080 acres surrounding the range are proposed for withdrawal. Of these, approximately 6,240 acres located east and north of B-19 would be managed as Category A land, and the remainder would be managed as Category B land. These lands provide a safety buffer, training areas, and a location for EW and visual cueing sites.

- Shoal Site—7,405 acres containing the DOE shoal site are proposed for withdrawal. The entire area would be designated Category B. The site would be used for integrated air and ground training, such as close air support and combat search and rescue. The Navy would withdraw the 2,765 acres of DOE land. Because this would be a withdrawal over a withdrawal, the DOE would retain responsibility for all subsurface resources and activities. The Navy would be responsible only for surface training activities, primary combat search and rescue scenarios. This is applicable for all alternatives.

- Dixie Valley Area—92,675 acres located north of Bravo-17 are proposed for withdrawal. The entire area would be managed under Category B status. Individual EW, TACTS, and visual cueing device sites would be developed. The Dixie Valley area also provides areas for integrated air and ground training.



This alternative would result in the withdrawal of over 189,000 acres, the largest withdrawal among the alternatives.

Alternative I

NAS Fallon, Nevada

Figure 2-7

Source: Tetra Tech

2.3.3.2 Alternative II (Preferred Alternative)

Under this alternative, approximately 127,365 acres would be withdrawn. Lands proposed for withdrawal are shown in general in Figure 2-8. Appendix I provides detailed maps of each withdrawal area. The amount of land withdrawn in the Dixie Valley area would be approximately 24,000 acres less than in Alternative I. The land west of B-16 would not be withdrawn. Only the central portion of the shoal site would be withdrawn. A panhandle of land would be withdrawn to connect the Dixie Valley area with the Navy-owned Dixie Valley lands.

The Alternative II footprint would avoid the Job Peaks WSA and would encompass all of the existing EW sites in the Dixie Valley area. Approximately 1,500 acres of land north of B-17 and Highway 50 and less than 100 acres off the northwest corner of B-17 are included to provide a continuous land management link between the Dixie Valley area and B-17 (see Figure 1-2). The withdrawal would not include the Highway 50 right-of-way or the Nevada Department of Transportation right-of-way along Dixie Valley Road. The 24,464 acres of BLM land closed because of off-range ordnance would still be withdrawn. Table 2-5 details the reasons for withdrawing each area. The withdrawn lands would be categorized as follows:

- Bravo-16—10,400 acres located north and southeast of the range would be withdrawn. Of these, 640 acres east of B-16 would be managed as Category A land under Navy control. All The remaining withdrawn land around B-16 would be managed under land use Category B. These lands provide a safety buffer and integrated air and ground training areas.

- Bravo-17—33,400 acres located primarily south of the range are proposed for withdrawal. These lands would be managed under Category A. These lands provide a safety buffer and integrated air and ground training areas and allow for placement of EW, TACTS, and visual cueing sites. Individual EW, TACTS, and visual cueing sites would be located in Fairview Valley.

- Bravo-19—12,200 acres surrounding the range are proposed for withdrawal. Of these, approximately 6,240 acres located north and east of the range would be managed by the Navy under land use Category A, and the remainder would be managed as Category B land. These lands provide a safety buffer and integrated air and ground training areas. EW and visual cueing sites would be placed on the withdrawn lands east of B-19.

- Shoal Site—2,765 acres of the DOE shoal site would be withdrawn. The entire area would be designated as Category B. The site would be used for integrated air and ground training activities.

- Dixie Valley area—68,600 acres located north of Bravo-17 are proposed for withdrawal. The entire area would be managed under Category B status. Individual EW, TACTS, and visual cueing device sites would be developed in this area. The Dixie Valley area also provides area for integrated air and ground training.

2.3.3.3 Alternative III

Under this alternative, approximately 152,765 acres would be withdrawn (Figure 2-9). More land would be withdrawn in the Dixie Valley area than under Alternative II. This additional land, along with the panhandle of land connecting the Dixie Valley area with Navy-owned Dixie Valley land, would provide range support by encompassing all existing EW sites in the Dixie Valley area, allowing for visual cueing device sites to be placed on the Dixie Valley area, and providing enough space for combat search and rescue operations.

Alternative III differs from Alternative I in that approximately 21,000 acres north of B-16, the land west of B-16, a portion of the shoal site, the land west of Highway 95 near B-19, and the land west of Scheelite Mine Road would not be withdrawn. Table 2-5 details the reasons for withdrawing each area.

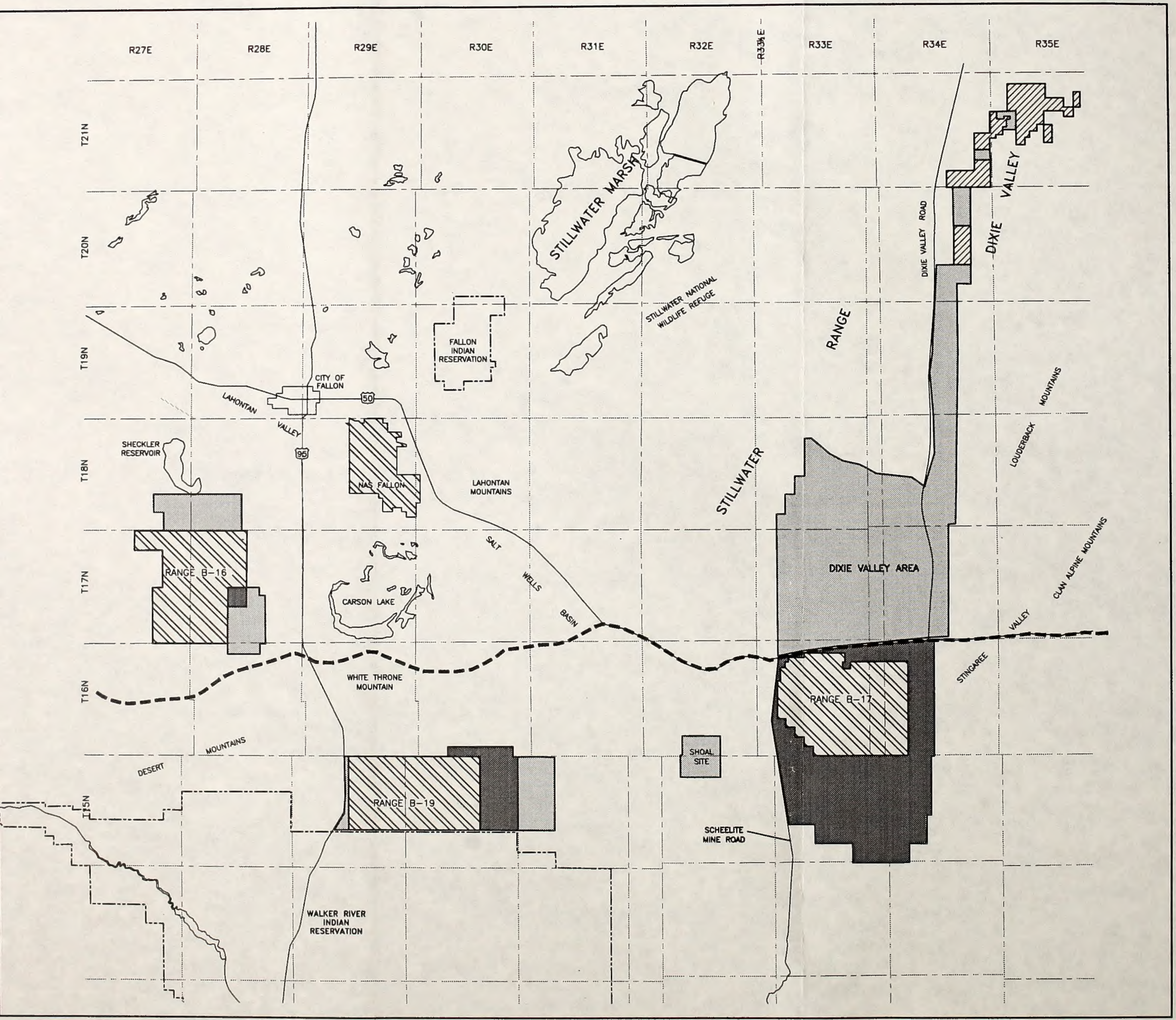
Uses of the withdrawn lands would be the same as discussed for Alternative II. The withdrawn lands would be categorized as follows:

- Bravo-16—10,400 acres located north and southeast of the range would be withdrawn. Of these 640 acres east of B-16 would be managed under land use Category A. All of the remaining withdrawn land around B-16 would be managed under land use Category B.

- Bravo-17—33,400 acres located primarily south of the range would be withdrawn. These lands would be managed under land use Category A.

- Bravo-19—12,200 acres surrounding the range are proposed for withdrawal. Of these, approximately 6,240 acres would be managed as Category A land, and the remainder would be managed as land use Category B.

- Shoal Site—2,765 acres containing the DOE shoal site are proposed for withdrawal. The entire area would be designated Category B.



LEGEND:

■ Category A Land (Restricted Use)

▒ Category B land (Regulated Development)

▨ Navy–owned Land in Dixie Valley

▧ NAS Fallon and Ranges

-·-·-·- Boundary of Indian Reservation

– – – – Pony Express National Historic Trail/ American Discovery Trail

N

0 2.5 5

1"=5MI. (APPROXIMATE)

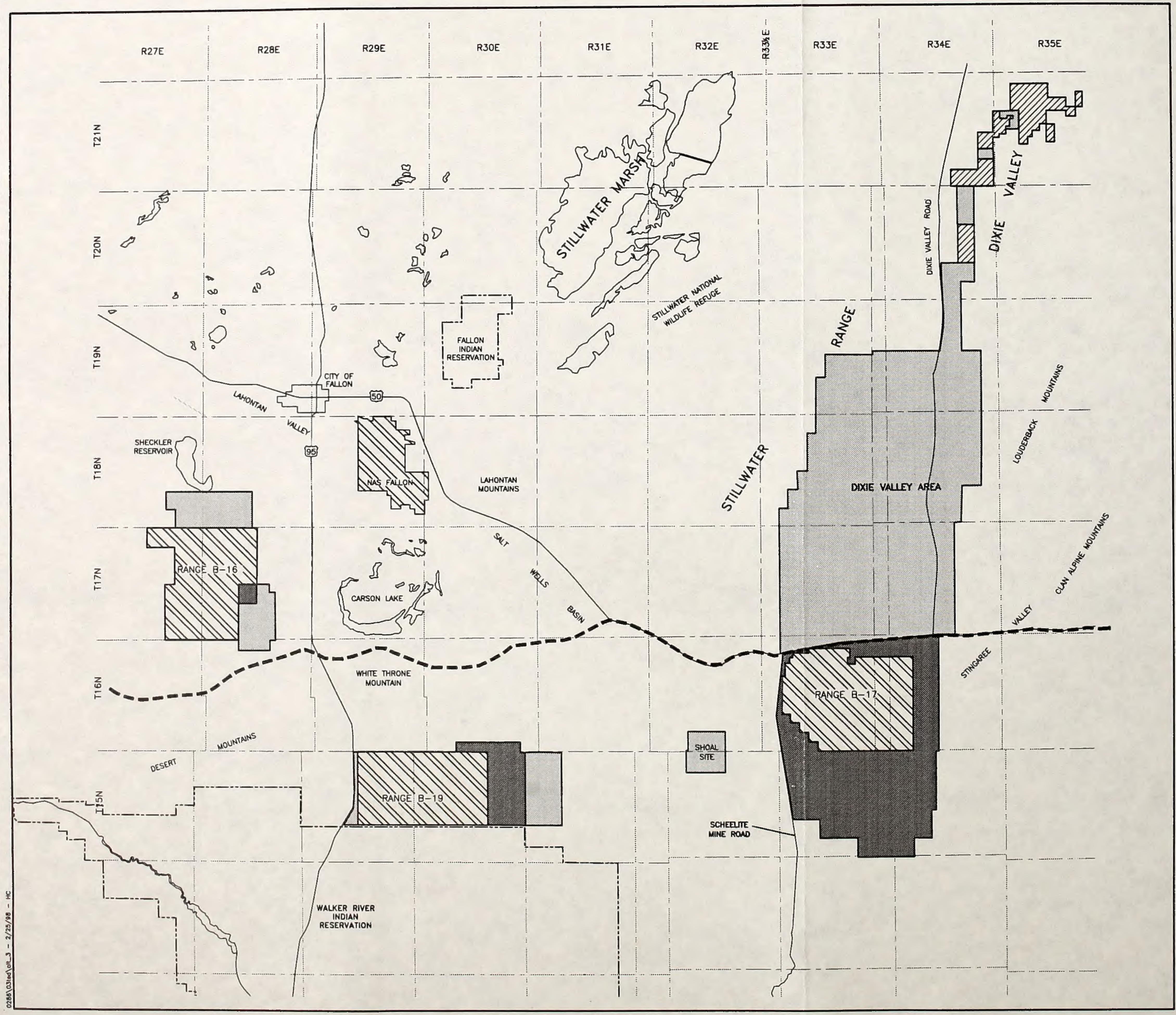
This alternative would withdraw 127,365 acres of land for Navy use. The panhandle connecting the Dixie Valley area and the Navy–owned Dixie valley lands would provide a necessary corridor for integrated air and ground training and EW, TACTS, and visual cueing.

Alternative II

NAS Fallon, Nevada

Figure 2-8

Source: Tetra Tech



LEGEND:

▓ Category A Land (Restricted Use)

░ Category B land (Regulated Development)

▨ Navy-owned Land in Dixie Valley

▧ NAS Fallon and Ranges

-·-·-·- Boundary of Indian Reservation

- - - - Pony Express National Historic Trail/ American Discovery Trail

N

0 2.5 5

1"=5MI. (APPROXIMATE)

This withdrawal would include 152,765 acres and includes a larger Dixie Valley area to allow for maximum training flexibility.

Alternative III

NAS Fallon, Nevada

Figure 2-9

Source: Tetra Tech

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- Dixie Valley area—94,000 acres located north of Bravo-17 are proposed for withdrawal. The entire area would be managed under Category B status. Individual EW, TACTS, and visual cueing device sites would be developed in this area. This area also would provide land for integrated air and ground training activities.

2.3.3.4 No Action Alternative

Under the No Action Alternative, the Navy would not withdraw any federally administered public lands around the FRTC training ranges (Figure 2-10). Navy operations would continue on existing ranges, in accordance with existing rights and regulations. Public lands, including those identified as containing off-range ordnance, would remain under the authority of the current controlling agencies.

2.4 SUMMARY OF ENVIRONMENTAL IMPACTS

This section provides an overview of the Chapter 4 environmental impact analysis and mitigation measures. Table 2-6 summarizes the impacts along with proposed mitigation measures. Chapter 4 provides details of the rational and reasoning for the impacts and mitigation measures.

As detailed in Chapter 4 and summarized in Table 2-6, the primary impact of the proposed land withdrawal would be the denial of public access on Category A lands. Loss of opportunities on these lands is unmitigable. The Navy will explore means to compensate holders of patented and valid unpatented mining claims, water rights, and grazing permits, subject to Congressional authorization and appropriation.

Adverse impacts to visual resources and recreation could occur on Category B lands from the development of EW, TACTS, and visual cueing device sites and from integrated air and ground training. Additional adverse impacts could occur from helicopter-related noise, height restrictions on structures, and restrictions on patenting mining claims.

The proposed land withdrawal would not result in significant geotechnical, biological, air quality, land use, environmental justice, public health and safety, or airspace impacts.

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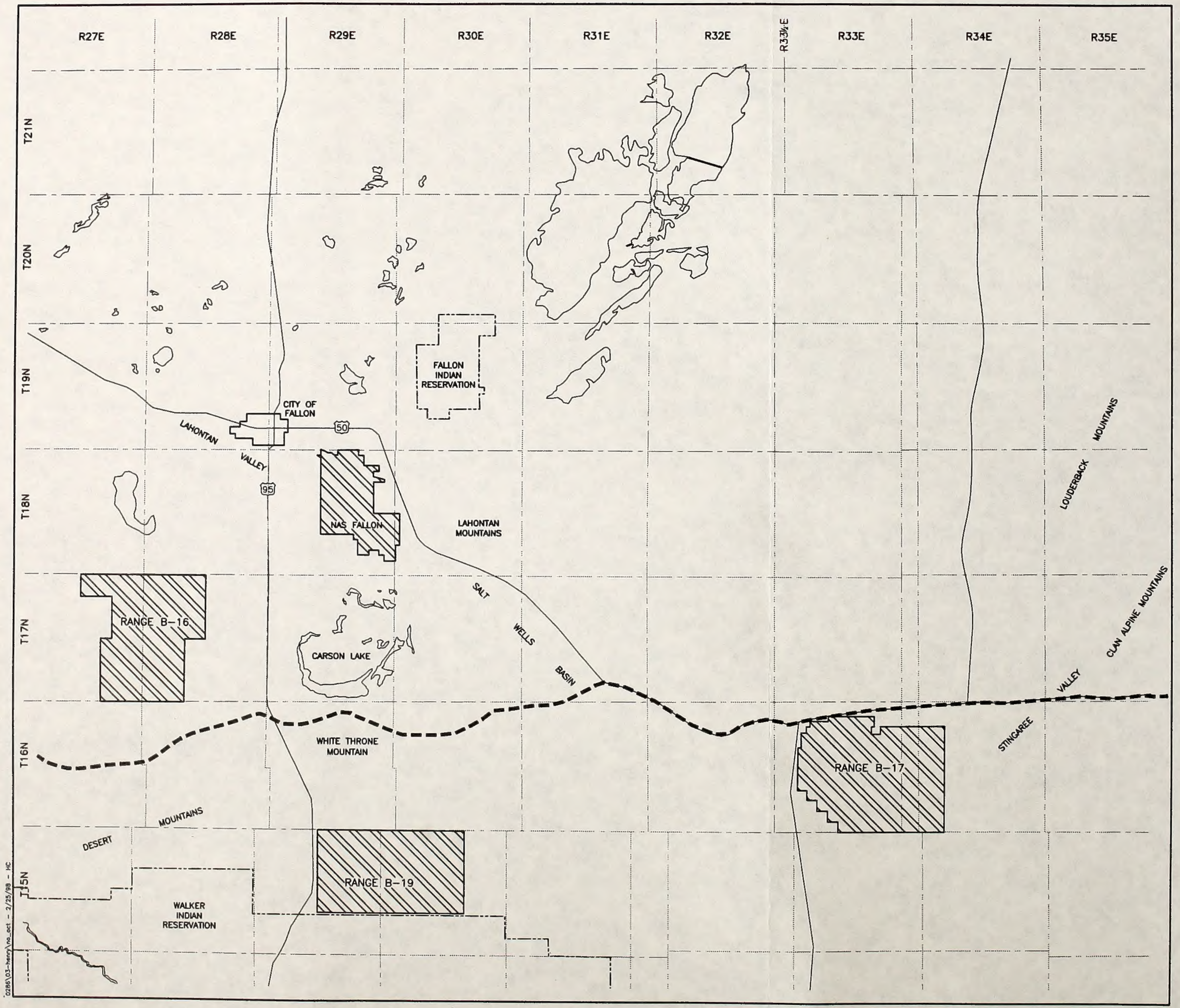


LEGEND:

- ▨ NAS Fallon and Ranges
- –·–·– Boundary of Indian Reservation
- – – – – Pony Express National Historic Trail/ American Discovery Trail

Under the No Action Alternative, no lands would be withdrawn.

No Action Alternative
NAS Fallon, Nevada
Figure 2-10

Source: USFWS 1995

TABLE 2-6
OVERVIEW OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES
(Page 1 of 6)

RESOURCE AREAS	ALTERNATIVE I		ALTERNATIVE II		ALTERNATIVE III		NO ACTION ALTERNATIVE	
	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation
Geotechnical/ Soils	No significant impacts. Potential minor impacts from Navy development of EW and TACTS sites and development of roads or utility corridors if needed. Impacts will be minimized by standard engineering controls and natural resource management techniques.	No mitigation required.	Similar to Alternative I.	No mitigation required.	Similar to Alternative I.	No mitigation required.	No impact.	No mitigation required.
Water Resources	No significant impacts. No new development of water resources or access to existing water developments on Category A lands except for BLM. No impacts to water quality from continued use of chaff.	Navy will explore means of compensation for loss of existing water rights, subject to Congressional approval and appropriation.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	Impacts to water developments on off-range ordnance lands would continue to be handled through Navy and BLM administrative processes.	No mitigation required.
Biological Resources	No significant impacts to endangered and threatened species. No impacts from continued use of chaff. EW/TACTS/visual cueing device sites and ground training will avoid sensitive habitats where possible. If not possible, direct mitigation will be undertaken. Site specific surveys conducted as necessary. NAS Fallon will comply with the requirements of federal and state regulations regarding biological resources. Navy will work with BLM to provide access to Category A lands for wildlife programs. Integrated air and ground training would increase ground disturbance, potentially harming vegetation and promoting the spread of noxious weeds.	The Navy will apply the Natural Resource Management Plan to withdrawn lands to control the spread of noxious weeds. To avoid impacts to migrating tarantulas, the Navy will not conduct ground training along Scheelite Mine Road during the migration periods. To reduce startle effects, no ground or low-level helicopter training below 500 feet above ground level (AGL) will take place within a half-mile radius of springs and water troughs.	Similar to Alternative I, with less area affected north of B-16.	No mitigation required.	Similar to Alternative I.	No mitigation required.	No impact.	No mitigation required.

TABLE 2-6
OVERVIEW OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES
(Page 2 of 6)

RESOURCE AREAS	ALTERNATIVE I		ALTERNATIVE II		ALTERNATIVE III		NO ACTION ALTERNATIVE	
	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation
Air Quality	No significant impacts. Minimal impact from construction and operation of EW and TACTS sites. Standard dust control measures would be applied during construction. Integrated air and ground training would generate localized dust. Continued dispersion of chaff would not affect air quality.	No mitigation required.	Similar to Alternative I.	No mitigation required.	Similar to Alternative I.	No mitigation required.	No impact.	No mitigation required.
Noise	Action would not increase number of jet aircraft. Short-term effects during construction of EW/TACTS sites. Helicopters used for integrated air and ground training could affect land users if within close range of operations, though it is standard operating procedure to avoid training near other land users.	Noise studies will be conducted to verify the Navy's position that there are no significant noise impacts resulting from existing operations at B-17 and B-19.	Similar to Alternative I, with less potential effects north of B-16 from a smaller withdrawal area.	Similar to Alternative I.	Similar to Alternative II.	Similar to Alternative I.	No impact.	No mitigation required.
Visual Resources	EW/TACTS sites and integrated air and ground training could result in potential adverse impacts by altering the visual character of the area. Impacts at sites would be reduced by using colors that blend with the background and by avoiding sensitive areas. Training visible from sensitive viewpoints would have impacts; most training likely would remain unnoticeable. Long-term chaff use could result in visible aluminum litter.	The visual impacts from chaff, though not significant, may be reduced if biodegradable chaff becomes viable.	Similar to Alternative I, although the affected area would increase in the panhandle area and decrease near the Job Peak WSA and north of B-16.	Similar to Alternative I.	Similar to Alternative I for Dixie Valley area and similar to Alternative II for area north of B-16.	Similar to Alternative I.	No impact.	No mitigation required.

TABLE 2-6
OVERVIEW OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES
(Page 3 of 6)

RESOURCE AREAS	ALTERNATIVE I		ALTERNATIVE II		ALTERNATIVE III		NO ACTION ALTERNATIVE	
	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation
Cultural Resources	No significant impacts. Navy will avoid siting EW/TACTS facilities on culturally significant sites. Predictive model and site surveys conducted as needed. Potential impacts from integrated training if conducted on surface resources. NAS Fallon will comply with federal regulations and with procedures set forth in CRMP and PA.	No mitigation required.	Similar to Alternative I.	No mitigation required.	Similar to Alternative I.	No mitigation required.	No impact.	No mitigation required.
Land Use *Closed Use of Category A Land*	Public access prohibited to protect public from off-range ordnance.	Not mitigable.	Similar to Alternative I.	Not mitigable.	Similar to Alternative I.	Not mitigable.	Navy would not withdraw any land. Off-range ordnance lands would remain closed.	No mitigation required.
Land Use *Development of Structures*	Structures would be limited by 50-foot height restrictions.	Development of structures over 50 feet could sometimes be allowed under Navy waiver.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	Navy would not withdraw lands, which could result in safety impacts from development of structures.	Close coordination with BLM to control developments.
Land Use *Geothermal Production*	No impact to current geothermal production or exploration. Modification of transmission lines would require Navy review and approval.	No mitigation required.	Similar to Alternative I.	No mitigation required.	Similar to Alternative I.	No mitigation required.	No impact.	No mitigation required.
Land Use *Constraints to County/City Development*	No additional constraints over current BLM/ BUREC/DOE procedures would be placed on development west of the City of Fallon.	No mitigation required.	Similar to Alternative I.	No mitigation required.	Similar to Alternative I.	No mitigation required.	No impact.	No mitigation required.

TABLE 2-6
OVERVIEW OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES
(Page 4 of 6)

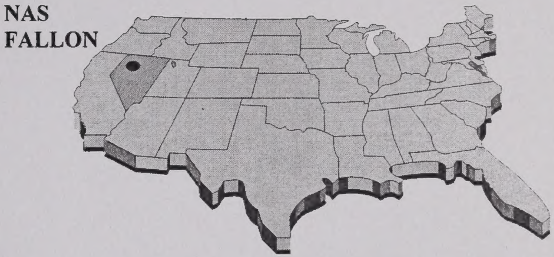
RESOURCE AREAS	ALTERNATIVE I		ALTERNATIVE II		ALTERNATIVE III		NO ACTION ALTERNATIVE	
	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation
Land Use *Job Peak WSA*	No impact. Although the area is managed as a Wilderness Area, Congressional designation has not occurred. Should the area be designated a Wilderness Area, it would be removed from the withdrawal footprint.	No mitigation required.	WSA not included in withdrawal footprint and would not be affected by withdrawal or training.	No mitigation required.	Similar to Alternative I.	No mitigation required.	No impacts.	No mitigation required.
Socioeconomics *Environmental Justice*	No significant impacts. No minority or low-income group would be disproportionately and adversely affected.	Noise studies will be conducted to verify the Navy's position that there are no significant noise impacts resulting from existing operations at B-17 and B-19.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	No impact.	No mitigation required.
Socioeconomics	No significant impacts to employment, residential development, or residential real estate values. Regional recreation income could decrease from the inclusion of Sheckler reservoir in the withdrawal area. No mining or grazing would be allowed on Category A lands. This could result in impacts from loss of revenue.	Loss of revenue unmitigable. The Navy will explore means to compensate holders of grazing permits and patented and valid unpatented mining claims, subject to congressional authorization and appropriation.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	No impact.	No mitigation required.
Mineral Resources	Category A lands would prohibit exploring, locating, developing, or patenting of claims, resulting in a significant impact. Category B lands would prohibit patenting of unpatented claims. No impact to existing claims because military sites will be located to avoid mining claims. Structure height generally would be limited to 50 feet on Category B lands.	The Navy will explore means of compensating holders of valid claims on Category A lands, subject to congressional approval and appropriation. The Navy will attempt to accommodate tall structures for short periods or in locales where they would not pose a safety hazard.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	No impact. Effects from emergency closure would continue to be handled through BLM and Navy administrative process.	No mitigation required.

TABLE 2-6
OVERVIEW OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES
(Page 5 of 6)

RESOURCE AREAS	ALTERNATIVE I		ALTERNATIVE II		ALTERNATIVE III		NO ACTION ALTERNATIVE	
	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation
Livestock and Wild Horse Management	Category A lands would prohibit grazing activities . No impacts to grazing or wild horse management from integrated air and ground training or EW/TACTS sites due to temporary and dispersed nature of activities. No impacts from continued use of chaff.	The Navy will explore means of compensating affected grazing permit holders on Category A lands, subject to congressional approval and appropriation. To minimize startling cattle and wild horses, the Navy will not conduct ground training or low-level flights under 500 feet AGL within a one-half mile radius of all springs and water troughs.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	No impact. Effects from emergency closure would continue to be handled through BLM and Navy administrative process.	No mitigation required.
Recreation and Public Access	Category A lands would prohibit public use. Public access would not be restricted on other withdrawn lands except at fenced EW and TACTS sites. Development of EW/TACTS sites and integrated air and ground training activities could adversely affect the quality of recreational experiences in the Dixie Valley area and north of B-16. No impact to the Pony Express National Historic Trail would occur.	Access and recreational impacts from closure of Category A lands not mitigable. Because these lands are or have the potential to be ordnance-contaminated, it is not possible to allow recreation and public access while preserving public safety. The Navy will provide education program materials on Navy training activities on Category B lands to the BLM, NDOW, and BUREC for public distribution. The Navy will make every effort to avoid the public during ground training activities. If there is an organized annual re-enactment of the Pony Express Trail ride, the Navy will work with trail personnel to alter flight activities during the event if compatible with training needs at the given time.	Similar to Alternative I, with less effects to recreation north of B-16.	Similar to Alternative I.	Similar to Alternative II.	Similar to Alternative I.	No impact. Effects from emergency closure would continue to be handled through BLM and Navy administrative process.	No mitigation required.

TABLE 2-6
OVERVIEW OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES
(Page 6 of 6)

RESOURCE AREAS	ALTERNATIVE I		ALTERNATIVE II		ALTERNATIVE III		NO ACTION ALTERNATIVE	
	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation
Public Health and Safety	No impacts. Beneficial effects from reduced public exposure to off-range ordnance. No impact from EW/TACTS sites or integrated air and ground training. No impacts from continued use of chaff except for chaff-related nuisance effects from degradation of radar or other electronic signals. Adverse chaff effects mitigated by continuing to clear major operations with the appropriate FAA facilities.	No mitigation required.	Similar to Alternative I.	No mitigation required.	Similar to Alternative I.	No mitigation required.	No lands would be withdrawn. Off-range ordnance lands would still be closed to the public, but BLM does not have the same resources available as the Navy to patrol lands and to ensure they are not accessed. Safety conditions identified in HAZARD studies would not be rectified.	Public safety impacts from off-range ordnance are not mitigable. The Navy would request that the BLM restrict development in potentially hazardous areas.
Transportation	No significant impacts. No impact to major highways. Roads on Category A land would continue to be closed. No increase in traffic expected from the withdrawal.	Closure of existing roads unmitigable. Alternate transportation routes may be identified for closed roads.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	Similar to Alternative I.	The closure of roads on off-range ordnance lands would continue to be addressed through Navy and BLM administrative processes.	No mitigation required.
Airspace Designation and Use	No impacts.	No mitigation required.	No impacts.	No mitigation required.	No impacts.	No mitigation required.	No impacts.	No mitigation required.



3.0 EXISTING ENVIRONMENT

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3. EXISTING ENVIRONMENT

The following analysis focuses on those resources potentially affected by the proposed land withdrawal and on topics that have received the most public concern. As a result, some areas or issues are addressed in greater detail than others. This has been done to assure that adequate attention will be focused on the most relevant issues. According to the CEQ regulations:

> "The environmental impact statement shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration. The descriptions shall be no longer than is necessary to understand the effects of the alternatives. Data and analyses in a statement shall be commensurate with the importance of the impact, with less important material summarized, consolidated, or simply referenced. Agencies shall avoid useless bulk in statements and shall concentrate effort and attention on important issues (40 CFR 1502.15)."

As described in Chapter 2, the land withdrawal is essentially a joint change in land jurisdiction and management. It is not anticipated that the withdrawal would directly cause an increase in air operations or in the size of the actual impact areas within the ranges. The proposal would impose some new land use controls that would have an effect on land use and public access for the withdrawn lands, particularly Category A lands. A resource management plan was developed in consultation with BLM, BUREC, and DOE subsequent to the withdrawal and would be submitted to the BLM for approval. The management and adjudication procedures for the withdrawn land would be defined by agreement among the Navy, BLM, BUREC, and DOE.

In addition, some resources on the ground could experience impacts as a result of the development of visual cueing device sites, TACTS sites, and EW sites. Integrated air and ground training operations also could result in impacts to resources on the ground.

Impacts are discussed in Chapter 4. Mitigation measures proposed as part of this proposed action or in response to potential impacts identified also are described in Chapter 4. Environmental conditions resulting from actions in the area that are not part of the current proposal are considered part of the existing environment. Of particular interest are noise conditions and uses of private lands that have been affected by military operations. Cumulative effects are described in Chapter 5.

Unless otherwise noted, all figures in this chapter illustrate a withdrawal area that is a composite of all of the alternative footprints. This withdrawal area is not representative of a specific alternative and covers more area than is proposed by any of the individual alternatives. Figure 2-1 shows the spatial relationship of the three action alternatives. This presentation shows the reader where existing environmental resources are located in relation to lands potentially affected by the proposed withdrawal.

3.1 GEOLOGY AND SOILS

The study area for this FEIS is within the Great Basin section of the Basin and Range province. The topography of the Great Basin is characterized by linear, roughly north-south trending mountain ranges that are separated by valleys, many of which are closed basins (Hunt 1974). NAS Fallon, B-16, the City of Fallon, and most of the populated and built-up portions of Churchill County are in a large depression known as the Lahontan Valley. The Dixie Valley area and B-17 are in a long north-south trending valley system known as Dixie Valley and Fairview Valley (refer to Figure 1-1 for locations of these areas). B-19 is in the Blow Sand Mountains and Rawhide Flats.

The rocks exposed in the mountain ranges are predominantly Tertiary sedimentary and volcaniclastic volcanic rocks (Stewart and Carlson 1977). These are underlain by Mesozoic and Paleozoic marine sedimentary, volcanic, and intrusive rocks that are exposed locally in the western, central, and northeastern portions. Mineralization appears to be associated primarily with Tertiary and Mesozoic rocks near igneous intrusions (SAIC 1991). The valleys between the mountain ranges are underlain by unconsolidated alluvial and playa (lake) deposits.

The rocks forming the linear, north-south trending mountain ranges are complexly deformed. The mountain ranges and their intervening valleys have been produced by Tertiary block faulting, tilting, and uplifting of the deformed bedrock (Hunt 1974; Stewart 1971). For example, Dixie and Fairview Valleys resulted from uplifting and tilting of the Stillwater Range to the west and the Clan Alpine Mountains to the east along faults at the bases of the ranges.

Widespread faulting has occurred on many of the mountain front faults in geologically recent times, and several faults in the vicinity of the proposed land withdrawal have been active in historic time (Thenhaus and Wentworth 1982; Hunt 1974; Ryall et al. 1966). The region is one of high seismicity (Ryall et al. 1966). The area experienced at least seven moderate to large earthquakes between 1900 and 1961.

Soils at B-16 follow a characteristic progression from the steep hillslopes on the west to the playa deposits at the center of the basin in the eastern portion of the range. The soils on the hillslopes are typically thin rocky soils derived from volcanic rocks. Further downslope, the soils near the base of the hillslopes consist of reworked alluvium, lakebed, and dune sands deposits. The presence of fine-grained materials in these deposits makes them relatively impermeable, although they tend to be friable and subject to wind erosion. Soils in the northeast and south portions of the range contain a higher proportion of dune sands; these soils are highly permeable. Toward the center of the basin the soils have formed on low lake terraces and are characterized by a thin impermeable subsurface layer at a depth of about six inches. In this layer, lacustine clays and precipitated salts cement the sand grains together when dry. Below this layer the soil consists of loose, highly permeable coarse sand. The deepest portions of the basin are underlain by playa deposits, which are fine-grained, poorly-drained, saline deposits that do not support vegetation. The susceptibility of soils to water erosion depends largely on slope and clay content. Clayey soils tend to resist erosion, while steep slopes increase erosion potential. Most of B-16 contains sandy soils on moderate to gradual slopes where erosion potential is slight. However, most of the soils in the area are moderately to highly susceptible to wind erosion (USDA 1991; SCS 1975). Rock fragments (desert pavement) on the surface and vegetation tend to stabilize the soil and reduce wind erosion.

The general characteristics of soils in the withdrawal areas associated with B-17, B-19, and the Dixie Valley area are similar to those in B-16. The soil characteristics vary according to where the areas are located—on steeply sloping upland, on alluvial fans and fan piedmonts, or on the valley floor. The Dixie Valley Wash is an area undergoing accelerated erosion and subsequent deposition of sediments. Detailed descriptions of numerous soil series identified in these areas are available in the soil survey documents prepared by the US Department of Agriculture (USDA) National Resources Conservation Service (NRCS).

3.2 WATER RESOURCES

The proposed land withdrawal areas are within four closed hydrographic basins. NAS Fallon and B-16 are within the Carson Desert Basin, B-17 and a portion of the Dixie Valley area are within the Fairview Valley Basin, most of the Dixie Valley area is within the Dixie Valley Basin, and B-19 is in the Rawhide Flats Basin. Potential evapotranspiration in the area greatly exceeds precipitation, but substantial runoff can occur during major storms. The Carson Desert Basin receives substantial quantities of irrigation water and return flows.

Regional surface water features include the Lahontan, Sheckler, and Stillwater Point Reservoirs, Carson Lake and various playa lakes, irrigation canals, natural (mostly ephemeral) streams, and springs.

Important water resources in the withdrawal area are developed springs, existing wells, storage tanks for livestock grazing, and guzzlers for wildlife use. There are three springs, three guzzlers, and 11 water storage tanks on lands that may be withdrawn (see Figure 3-10).

The principal water body associated with B-16 is Sheckler Reservoir, which is near the northern boundary of B-16 and contains water only periodically during the year. Several major ephemeral stream channels converge to the northwest of B-16, cross it, and then discharge into Carson Lake. The area also includes segments of three main irrigation canals but no perennial springs, streams, or drilled wells. The water table beneath the central portion of the basin is expected to be very shallow.

A topographic divide separates Dixie Valley from Fairview Valley within the southern portion of the Dixie Valley area. Dixie Valley receives surface water from ephemeral streams to the north and south and as ground water underflow from the Fairview Valley. Fairview Valley is topographically closed. Dixie Valley contains one perennial stream, Horse Creek, and numerous springs, including several thermal springs. The ground water table in the Dixie Valley is fairly high, and several free-flowing wells are present. The wells are concentrated in the northern and central portion of the valley. The shoal site is near the summit of the Sand Springs Range. No permanent bodies of water, springs, or streams are found on this site, but a major ephemeral drainage crosses the eastern portion of the sites and drains into Fairview Valley.

B-19 straddles the Blow Sand Mountains, which form the topographic divide between the Rawhide Flats and the Carson Desert Basins. There is no perennial surface water flow into or out of Rawhide Flats. No streams and only one spring appear in B-19.

3.3 BIOLOGICAL RESOURCES

Biological resources discussed in this section include vegetation, wildlife, sensitive species, and sensitive habitats on the project site and surrounding area. The affected area for biological resources encompasses land currently owned or controlled by NAS Fallon and proposed withdrawal lands. Biological information for the Lahontan Valley is presented where site-specific data are not available. In 1996 and 1997 an ecological survey was conducted at NAS Fallon, the existing training ranges, and the Dixie Valley landholdings (US Navy 1997b). The survey recorded 458 plant species, 23 reptile and four amphibian species, 126 bird species, 11 mammal species, and nine species of bats.

3.3.1 Regulations

3.3.1.1 Federal Endangered Species Act

Federal law directs that all federal agencies and departments use their authority to preserve endangered and threatened species under the guidance of the Endangered Species Act (ESA). The ESA requires that the US Fish and Wildlife Service (USFWS) issue a permit prior to implementing actions that would result in the taking of a federally-listed endangered or threatened species or modification to their habitat. This permit process is directed under Section 7 of the ESA for actions in which a federal agency is involved. Federal agencies are required to consult with the USFWS prior to undertaking actions that may affect endangered species. A federal agency is required to obtain a biological opinion from the USFWS on whether its actions may jeopardize the continued existence of any threatened or endangered species. This biological opinion normally is issued after the USFWS reviews the draft environmental document. Federal agencies are prohibited from enacting activities that would jeopardize the continued existence of these species.

3.3.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1972 prohibits the taking of individuals, nests, or eggs of a migratory bird species.

3.3.1.3 Clean Water Act

The Army Corps of Engineers (COE) regulates impacts to wetlands under Section 404 of the Clean Water Act (CWA). Wetlands are considered important to the public interest in that they perform significant biological functions, such as controlling sediment and pollution and providing nesting, breeding, foraging, and spawning habitat for a wide variety of resident and migratory animal species (Corps of Engineers Regulatory Program Regulations, §33 CFR 320.4). Projects that include potential dredge or fill impacts to wetlands must be reviewed by the COE and the US Environmental Protection Agency (EPA) under the CWA. NAS Fallon is delineating and mapping wetlands on all current land holdings and will use the same process on any new lands withdrawn. The Navy adheres to a "no net loss" policy, in which any action that affects a wetland will be mitigated according to Navy standards and as required under Section 404 permits.

3.3.2 Vegetation

Vegetation communities within the proposed land withdrawal areas are typical of the Great Basin region. Appendix F lists plant species commonly found in the region. Salt and alkali flats are found throughout the Lahontan Valley. Upland vegetation communities in the vicinity of the proposed withdrawal areas are all desert shrub communities and include greasewood, greasewood-shadscale, saltgrass, rabbitbrush, sagebrush, and pinyon-juniper at higher elevations (BLM 1982a, USFWS 1995). Vegetation in the greasewood and greasewood-shadscale communities are the most dominant plants within the withdrawal areas. These general vegetation types are discussed below. Detailed descriptions of the diverse plant communities in this area are available as ecological site descriptions prepared by the BLM and NRCS. No active agricultural lands are within the proposed withdrawal areas. Several riparian corridors and other wetland communities are present on land owned or controlled by NAS Fallon. These are discussed in Section 3.3.5 as sensitive habitats.

Elevation, climate, soil properties, and disturbance factors influence vegetation within this region. Elevations range from 4,000 feet at Sheckler Reservoir to 8,300 feet near Fairview Peak. Average annual rainfall varies from four inches per year on the valley bottoms to over 14 inches in the higher elevations (BLM 1983). Soils in the region are discussed in Section 3.1. Much of the NAS Fallon region contains disturbed vegetation. Disturbances generally relate to military and nonmilitary human activities. Military disturbances have resulted from ordnance, road construction, utility lines, and the construction of military-related structures. Nonmilitary disturbances include those from mining, grazing, recreation, and public utilities (Navy 1995a).

3.3.2.1 Salt and Alkali Flats

Salt and alkali flats (playas) appear in the lowest elevations of the Great Basin valleys. Water rising to the surface brings up salts, and when the water evaporates it forms these salt flats. While these areas tend to be devoid of vegetation, iodinebush (*Allenrolfea occidentalis*) and inland saltgrass (*Distichlis spicata* var. *stricta*) may establish themselves in areas where alkalinity is lower and the soil is moist.

3.3.2.2 Greasewood

Black greasewood (*Sarcobatus vermiculatus*) is the dominant plant species for alkaline soils adjacent to the playa areas. This community also commonly supports shadscale (*Atriplex confertifolia*), alkali seepweed (*Suaeda* sp.), Bailey greasewood (*Sarcobatus vermiculatus baileyi*), rubber rabbitbrush (*Chrysothamnus nauseosus*), bud sagebrush (*Artemesia spinescens*), and winterfat (*Ceratoides lanata* var. *lanata*). Understory species may include grasses, such as squirreltail (*Elymus elymoides*), inland saltgrass, Great basin wild rye (*Elymus cinereus*), alkali sacaton (*Sporobolus airoides*), cheatgrass brome (*Bromus* tectorum), and forbs, including milkvetch (*Astragalus* sp.), wedgescale saltbush (*Atriplex truncata*), pepperweed (*Lepidium nitidum*), halogeton (*Halogeton glomeratus*), and Russian thistle (*Salsola kali tenifolia*).

3.3.2.3 Greasewood-Shadscale

Greasewood-shadscale communities generally are found on alluvial fans, fan remnants, old lake terraces, foothill slopes, and lower mountain slopes (BLM 1982a). This vegetation association ranges between 4,000 and 6,500 feet in elevation. Soils are generally high in alkalinity and have a high content of soluble salts (BLM 1982a). Soil textures vary from gravely loam with desert pavement appearance to large sheets of eolian or alluvial sands and vegetated sand dunes. In addition to Bailey greasewood, black greasewood and shadscale, other species found in this community include four-winged saltbush (*Atriplex canescens*), sagebrush, rabbitbrush, bud sage brush, and spiny hop-sage (*Grayia spinosa*). Species of the understory include desert needlegrass (*Achnatherum speciosa*), field mustard (*Brassica campestris*), milkvetch, globemallow (*Sphaeralcea* sp.), birdcage evening primrose (*Oenothera deltoides* var. *piperi*), squirrel tail, Indian ricegrass (*Oryzopsis hymenoides*), inland saltgrass, galleta grass (*Hilaria* sp.), and cheatgrass.

3.3.2.4 Saltgrass

Saltgrasses tend to grow near playas where alkalinity and soil moisture is present. These communities are dominated by inland saltgrass and include black greasewood and a variety of forbs. Although uncommon on lands owned or controlled by NAS Fallon, saltgrass may be found in the proposed withdrawal areas.

3.3.2.5 Rabbitbrush

Rabbitbrush communities have developed in disturbed areas where native species have been replaced by rubber rabbitbrush. Other shrub species that may be found in this community include green rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *puberulus*), hopsage, shadscale, and winterfat. Common grass species include Indian ricegrass, inland saltgrass, and cheatgrass.

3.3.2.6 Sagebrush

Sagebrush communities are uncommon in the region of NAS Fallon and are found on upland terraces, alluvial and mountain valley fans, foothill slopes, and mountain slopes and ridges between 4,300 and 10,000 feet in elevation. Soil characteristics vary from dry, rocky, and shallow soils to sandy or loamy soils that are moderately deep to deep. Annual precipitation typically varies between six and 12 inches over much of this region. Sagebrush species include basin big sagebrush (*Artemisia tridentata tridentata*), Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), or mountain big sagebrush (*Artemisia vaseyana*), depending on location. Understory species associated with big sagebrush plant communities include Sandberg's bluegrass (*Poa sandbergii*), Indian ricegrass, basin wildrye, bottlebrush squirreltail, Thurber's needlegrass (*Achnatherum thurberianum*),

milkvetch, and lupine (*Lupinus* sp.). In addition, at the upper elevations of this community, where associations with pinyon-juniper communities are found, bluebunch wheatgrass (*Agropyron spicatum*), Idaho fescue (*Vulpia idahoensis*), and snowberry (*Symphoricarpos* sp.) may be present.

3.3.2.7 Pinyon-Juniper

Pinyon-juniper communities are found on upper foothill side slopes, ridges, and mountain slopes from 5,000 to 8,000 feet (BLM 1982a). Soil conditions are generally loamy and shallow. Annual precipitation typically varies between eight and 14 inches (BLM 1982a). Shrub species common in this community include big sagebrush, gooseberry (*Ribes* sp.), and rabbitbrush. Grass species, such as bluegrass (*Poa* sp.), needle grass (*Achnatherin* sp.), cheatgrass, and basin wild rye, are common within this vegetation type. Pinyon-juniper vegetation is present on Fairview Peak, west of B-17, and the Stillwater and Clan Alpine mountain ranges in the Dixie Valley area.

3.3.2.8 Disturbed Areas

Much of the land in the proposed withdrawal areas has been disturbed by human activities. These include areas of military disturbance in the range areas and the Dixie Valley area. Other human-related disturbances, such as ranch and mine areas, road corridors, and utility corridors, also occurred in these areas. Species composition in these areas is dominated by nonnative invasive species, such as Russian thistle, cheatgrass, halogeton, Russian knapwood (*Centaurea repens*), white-top (*Cardaria draba*), and other nonnative agricultural and landscape species. Natural disturbances, such as fire and flooding also occur periodically in the withdrawal areas and on lands owned or controlled by NAS Fallon.

The NRCS described range condition classes to evaluate the condition of vegetation on the NAS Fallon ranges. This inventory rated these areas as excellent, good, fair, or poor, based on the present state of vegetation versus the expected natural potential for each area. The ranges were described as follows and ranged from poor in areas of B-17 to excellent in parts of B-16 (SAIC 1991):

• B-16	1984	Excellent to good
• B-17	1985	Good, fair, and poor
• B-19	1984	Good
• Dixie Valley	1985	Good to fair

3.3.3 Wildlife

Appendix F lists wildlife species that inhabit the region, including invertebrates, fish, amphibians and reptiles, birds, and mammals. The proposed withdrawal areas provide habitat for a number of game species, nongame wildlife species, and sensitive species.

3.3.3.1 Game Species

Game species in the region include fish, birds, and mammals. The BLM administers programs to promote habitat for game and nongame species.

Game fish species found in reservoirs and deeper wetlands in the area include white bass (*Morone chrysops*), channel catfish (*Ictalurus punctatus*), white catfish (*Ictalurus catus*), walleye (*Stizostedion vitreum*), white crappie (*Pomoxis annularis*), yellow perch (*Percan flavescens*), and largemouth blackbass (*Micropterus salmoides*).

Small game guzzlers have been installed for chukars (*Alectoris chukar*) and mourning doves (*Zenaidura macroura*) in the Sand Springs Range, Cocoon Mountains, Clan Alpine Mountains, and Lauderback Hills (Figure 3-10). Many waterfowl game species are found at Sheckler Reservoir north of B-16. These include such species as the mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), and Canada goose (*Branta canadensis*).

Mule deer (*Odocoileus hemionus*) is the most important big game species in the region and tends to be concentrated in adjacent mountain ranges, such as the Stillwater, Clan Alpine, and Desatoya Ranges, although it is also found commonly in valleys (NDOW 1982). Bighorn sheep (*Ovis canadensis*)have been reintroduced in the Clan Alpine Range and are also found in the Sand Springs Range, Lauderback Range, Chalk Mountain, Fairview Peak/Slate Range, and the Stillwater Range. Other game mammals include the mountain lion (*Felis concolor*) and bobcat (*Lynx rufus*). Big game guzzlers are located in the Fairview Peak and Slate Mountain ranges.

3.3.3.2 Invertebrates

A wide variety of invertebrates were identified at NAS Fallon, the training ranges, and the Dixie Valley landholdings during the ecological surveys including annelids (one species), mollusks (two species), crustaceans (five species), arachnids (one species), and insects (21 species). Of the 21 insect species identified, five are special-status species and are discussed further in Section 3.3.4. The surrounding lands historically contained freshwater clams, mussels, shrimp, and snails in region wetlands. Most major orders of aquatic insects are found in the wetlands (USFWS 1995).

It is known that once a year tarantulas migrate along Scheelite Mine Road, just west of B-17. This migration generally occurs in September and generally lasts about four to six weeks.

3.3.3.3 Fish

Approximately 15 species of nongame fish exist in the reservoirs and deeper wetlands in the Lahontan Valley (USFWS 1995). Few surveys for fish species have been conducted in the proposed withdrawal areas. Common nongame fish species in the region include Asiatic carp (*Cyprinus carpio*), Sacramento blackfish (*Orthodon microlepidotus*), Lahontan tui chub (*Gila bicolor obesus*), Dixie Valley tui chub (*Gila bicolor* spp.), Lahontan red shiners (*Richardsonius egregius*), Lahontan speckled dace (*Rhinichtys osculus robustus*), Lahontan mountainsuckers (*Pantosteus lahontan*), Tahoe suckers (*Catostomas tahoensis*), fathead minnows (*Pimephales promelas*), and mosquito fish (*Gambusia affinis*). A survey completed in 1994 involved sampling Dixie Valley tui chub in Dixie Valley and characterized brook trout populations in Horse Creek.

3.3.3.4 Amphibians and Reptiles

The ecological survey of NAS Fallon, the training ranges, and Dixie Valley landholdings recorded 23 reptile and four amphibian species (US Navy 1997b). Amphibian and reptile species common in the region include the western fence lizard (*Sceloperus occidentalis*), side-blotched lizard (*Uta stansburiana*), gopher snake (*Pituophis melanoleucus*), and Great Basin rattlesnake (*Crotalus viridis*).

3.3.3.5 Birds

Bird species in the Lahontan Valley region include waterfowl, shorebirds, colony-nesting and other marsh birds, songbirds, and raptors. Game birds are discussed in Section 3.3.3.1. Changes in water management, including declining wetlands and increased development in the region, are believed to have adversely affected the abundance and diversity of birds in the area (USFWS 1995). The ecological survey of NAS Fallon, the training ranges, and the Dixie Valley landholdings recorded 126 bird species (US Navy 1997b).

The Lahontan Valley is a major stopover area for migrating waterfowl, with approximately 70 percent of the birds migrating through the state using the regional wetlands (USFWS 1995). Waterfowl species common in the region include the green-winged teal (*Anas crecca*), northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), American widgeon (*Anas americana*), cinnamon teal (*Anas cyanoptera*), redhead (*Aythya americana*), gadwall (*Anas strepera*), Canada goose, snow goose (*Chen caerulescens*), and tundra swan (*Cygnus columbianus*).

The region's wetlands also provide critical habitat for migrating shorebirds. Wetlands at Stillwater National Wildlife Refuge and Carson Lake have been designated part of the Western Hemispheric Shorebird Reserve Network.

Shorebirds common in this region include the American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), western snowy plover (*Charadrius alexandrinus*), killdeer (*Charadrius vociferus*), common snipe (*Gallinago gallinago*), long-billed curlew (*Numenius americanus*), and Wilson's phalarope (*Phalaropus tricolor*).

Colony-nesting and other marsh birds include those that migrate through the region and nest in the wetlands but that are not waterfowl or shorebirds. This category includes the California gull (*Larus californicus*), ring-billed gull (*Larus delawarensis*), black tern *(Chlidonias niger*), Forster's tern (*Sterna forsteri*), great egrets (*Casmerodius albus*), snowy egrets (*Egretta thula*), cattle egrets (*Bubulcus ibis*), great blue herons (*Ardea herodias*), black-crowned night herons (*Nycticorax nycticorax*), double crested cormorants (*Phalacrocorax auritus*), eared grebe (*Podiceps nigricollis*), western grebe (*Aechmophorus occidentalis*), Clark's grebe (*Aechmophorus clarkii*), American white pelicans (*Pelacanus erythrorhynchos*), white-faced ibis (*Plegadis chihi*), Virginia rails (*Rallus limicola*), soras (*Porzana carolina*), common moorhens (*Gallinula chloropus*), and American coots (*Fulica americana*).

Songbirds in the region can be divided into two groups, those dependent on riparian or wetlands habitats and those supported by upland habitats. The diversity in vegetation and presence of water within riparian habitats provides for a greater diversity of songbird species in these areas. Common songbirds in the riparian areas of the proposed withdrawal areas may include the western wood-pewee (*Contopus sordidulus*), house wren (*Troglodytes aedon*), yellow warbler (*Dendroica petechia*), MacGillivray's warbler (*Oporornis tolmiei*), Bewick's wren (*Thryomanes bewickii*), black-headed grosbeak (*Pheucticus melanocephalus*), northern oriole (*Icterus galbula*), and northern flicker (*Colaptes auratus*). Upland habitats support species such as the rock wren (*Salpinctes obsoletus*), sage thrasher (*Oreoscoptes montanus*), horned lark (*Eremophila alpestris*), savannah sparrow (*Passerculus sanwichensis*), and white-crowned sparrow (*Zonotrichia leucophrys*). There is little data about the status of songbird populations in this region (USFWS 1995).

Many raptor species are migrants through the Lahontan Valley and several nest in the region. Nesting species include the golden eagle (*Aquila chryaetos*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), osprey (*Pandion haliaetus*), and prairie falcon (*Falco mexicanus*). Several owl species nest in the region, including the burrowing owl (*Athene cunicularia*), great horned owl (*Bubo virginianus*), short-eared owl (*Asio flammeus*), and western screech owl (*Otus kennicottii*). There is little quantitative data regarding raptor species populations in this region (USFWS 1995). Foraging and nesting habitat for raptors exists in the areas proposed for withdrawal. On March 4, 1996, a wildlife biologist from NAS

Fallon conducted a raptor survey on lands south of B-16. There is one hill that contains rock outcrops and cliff-like rim rocks that are suitable raptor nest sites (Section 12, T16N, R27E). No raptors or other birds were observed, and no residue from old bird nests was recorded (Rathbun 1996a).

Several bird species that are found in this region are not native to the Great Basin and are associated with developed areas. These species can displace native bird species and harm other native wildlife by monopolizing food sources or breeding sites. These include the house sparrow (*Passer domesticus*) and European starling (*Sturnus vulgaris*).

3.3.3.6 Mammals

Nongame mammal species common in the region include bats, small mammals, and large mammals. The greatest diversity of mammal species are found in upland habitats in the region.

Surveys conducted during 1996 and 1997 at NAS Fallon, the training ranges, and the Dixie Valley landholdings observed the following bat species: pallid bat (*Antrozous pallidus*), small-footed myotis (*Myotis subulataus*), Townsends big eared bat (*Cory norhinus townsendii*), Mexican free-tailed bat (*Tadarida brasiliensis*), big brown bat (*Eptesicus fuscus*), California myotis (*Myotis californicus*), long-eared myotis (*Myotis evotis*), hairy winged myotis (*Myotis volans*), and western pipistrelle (*Pipistrellus hesperus*). Other species possibly occurring in the region include little brown bat (*Myotis lucifugus*), Yuma myotis (*Myotis yumanensis*), spotted bat (*Euderma meculatum*), silver-haired bat (*Lasionycteris noctivagans*), red bat (*Lasiurtus blossevillii*), hoary bat (*Lasiurus cinereus*), and fringed myotis (*Myotis thysanodes*) (Navy 1997b).

Small mammals common to the region include the little pocket mouse (*Perognathus longimembris*), Great Basin kangaroo rat (*Dipodomys microps*), deer mouse (*Peromyscus maniculatus*), and desert woodrat (*Neotoma lepida*). Large mammals found in the region include bighorn sheep, blacktailed jackrabbit (*Lepus californicus*), striped skunk (*Mephitis mephitis*), badger (*Taxidea taxus*), coyote (*Canis latrans*), and desert kit fox (*Vulpes macrotis*). Habitat is present in the proposed withdrawal areas to support these species. The Chalk Mountains are known to be a bighorn sheep lambing area. The ecological survey of NAS Fallon, the training ranges, and the Dixie Valley land holdings trapped 11 mammal species, with the greatest abundance at B-17, B-19, and the Dixie Valley land holdings. Kangaroo rats were the most abundant.

3.3.4 Sensitive Species

Sensitive species are defined as those that are listed by the USFWS or by the Nevada Division of Wildlife (NDOW) as endangered, threatened, proposed for endangered or threatened status, candidate species, or species of concern. Also included as sensitive species are those listed by the Northern Nevada Native Plant Society (NNNPS). Table 3-1 lists sensitive species found in the area of NAS Fallon. The ecological inventory of NAS Fallon-administered lands recorded only one state special-status species, the sand cholla (*Opuntia pulchella).*

3.3.4.1 Plants

No endangered or threatened plants are found in the Lahontan Valley. Four state species of concern are found in the region that could exist on lands owned or controlled by NAS Fallon (Table 3-1). The sand cholla was observed at three locations in the northwestern portion of B-16 during the 1996/1997 ecological survey (US Navy 1997b). This species generally occurs in xeric Bailey's greasewood-shadescale habitats and is protected under the Nevada Cactus and Yucca Law.

3.3.4.2 Wildlife

Four species federally listed as endangered or threatened are found in the region, the cui-ui (*Chasmistes cujus*), Lahontan cutthroat trout (*Onchorhynchus clarki henshawi*), bald eagle (*Haliaeetus leucocephalus*), and American peregrine falcon (*Falco peregrinus anatum*). Of these, only the bald eagle and American peregrine falcon may inhabit the lands proposed for withdrawal. The two fish species (cui-ui and Lahontan cutthroat trout) are found in Pyramid Lake and associated drainages over five miles from lands proposed for withdrawal.

The bald eagle is a federally threatened species. This species is primarily a winter visitor in Nevada. Preferred wintering habitat frequently consists of lakes, reservoirs, wetlands, and rivers associated with regulating reservoirs (NDOW undated). Bald eagles are seen in the region each year between November and April. They are regularly found from December through February at the Stillwater Wildlife Management Area (USFWS 1982) and have been observed at Carson Lake (Saake 1987). The most recent observation was a nesting pair at the Lahontan Reservoir in 1997. The pair successfully incubated an egg, but the eaglet did not survive.

The regional bald eagle population is concentrated in the areas of Stillwater NWR, Carson Lake, and the Lahontan Reservoir. Timber Lake is the primary bald eagle winter roost site in the region and is located north of the

TABLE 3-1
SENSITIVE SPECIES POTENTIALLY INHABITING THE WITHDRAWAL AREAS

Common Name	Scientific Name	Federal/State or NNNPS Status[1]	Preferred Habitat[2]	Existence at NAS Fallon[3]	Existence in Proposed Withdrawal Lands[3]
Endangered and Threatened					
Fish					
Cui-ui	*Chasmistes cujus*	E/Y	L/S	U	U
Lahontan cutthroat trout	*Onchorhynchus clarki henshawi*	T/Y	S/L	U	U
Birds					
American peregrine falcon	*Falco peregrinus anatum*	E/Y	W/U/A	Q	O
Bald eagle	*Haliaeetus leucocephalus*	T/Y	W/R/U/A	Q	O
Other Sensitive Species					
Plants					
Altered andesite buckwheat	*Eriogonum robustum*	SC/W	U/A	P	P
Sand cholla	*Opuntia pulchella*	/CY	U	P	P
Nevada orycytes	*Oryctes nevadensis*	SC/W	U	P	P
Nevada dune beardtongue	*Penstemon arenarius*	SC/W	U	P	P
Invertebrates					
Nevada viceroy	*Limenitus archippus lahontani*	SC	R	P	P
California floater	*Anodonta californiensis*	SC	U	P	P
Hardy's aegialian scarab beetle	*Aegialia hardyi*	SC	U	P	P
Sand Mountain aphodius scarab beetle	*Aphodius psammobunus*	SC	U	P	P
Sand Mountain blue butterfly	*Euphilotes rita pallescens*	SC	U	P	P
Sand Mountain serican scarab beetle	*Serica psammobunus*	SC	U	P	P
Fish					
Dixie Valley tui chub	*Gila bicolor* ssp.	SC	L/S	U	P
Lahontan tui chub	*Gila bicolor obesus*	SC/Y	L/S	U	U
Amphibians and Reptiles					
Northwestern pond turtle	*Clemmys marmorata marmorata*	SC	R/W	U	U
Birds					
Northern goshawk	*Accipiter gentilis*	SC/Y	W/R	U	P
Western burrowing owl	*Athene cunicularia*	SC	U	P	P
Ferruginous hawk	*Buteo regalis*	SC/Y	W/R/U/A	Q	Q
Western snowy plover	*Charadrius alexandrinus*	SC	W	U	Q
Black tern	*Chlidonias niger*	SC/Y	W	U	Q
Western least bittern	*Ixobrychus exilis hesperis*	SC/Y	W	U	Q
Loggerhead shrike	*Lanius ludovicianus*	SC	U	P	P
Trumpeter swan	*Cygnus buccinator*	SC	W	U	Q
White-faced ibis	*Plegadis chihi*	SC/Y	W/A	U	Q
Mammals					
Townsends big eared bat	*Cornorhinus townsendii*	SC	U	P	P
Yuma myotis	*Myotis yumanensis*	SC	U	P	P
Spotted bat	*Euderma maculata*	SC/Y	U	P	P
Pygmy rabbit	*Sylvilagus idahoensis*	SC/Y	U	P	P
Small-footed myotis	*Myotis subulatus*	SC	U	P	P
Cave myotis	*Myotis velifer*	SC	U	P	P
Long-legged myotis	*Myotis volans*	SC	U	P	P

Sources: BLM 1983; NDOW 1995a; SAIC 1991; USFWS 1995, 1994a, 1994b; US Navy 1997b.

[1] Federal Status
E = endangered, T = threatened
SC = Species of Concern

NNNPS Status
W = watch - potentially vulnerable
Nevada State Status (NDOW)
CY = protected as a cactus or yucca under state law
Y = state protected

[2] Habitat
W = wetland/marsh
R = riparian
U = upland
A = agricultural
L = lake
S = stream

[3] Existence at NAS Fallon/Proposed Withdrawal Lands
C = confirmed nesting/breeding
O = confirmed occasional visitor
P = possible nesting/breeding
Q = possible occasional visitor
U = unlikely

City of Fallon. Other areas frequented by wintering bald eagles include Indian Lakes, S-Line Reservoir, Sheckler Reservoir, and Harmon Reservoir (USFWS 1995).

The peregrine falcon is a federally endangered species. This species has been recorded at Carson Lake and at the Stillwater NWR (BLM undated b; USFWS 1982; USFWS 1995). Individual peregrine falcons have been observed on at least 29 occasions during 1990 through 1997, with no sightings recorded for 1992.

Several species of concern inhabit the region and may be found on the withdrawal lands, including the western burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), ferruginous hawk (*Buteo regalis*), townsends big eared bat (*Corynorhinus townsendii*), Yuma myotis (Myotis yumanensis), and Dixie Valley tui chub (*Gila bicolor* ssp.). In addition, the Sand Mountain serican scarab (*Serica* sp.) is a beetle listed as a species of concern and is believed to be endemic to the Blow Sand Mountains east of B-19 (Phillips 1987). The Hardy's aegialian scarab beetle (*Aegialia hardyi*) also has been identified in the Blow Sand Mountains. The 1996/1997 ecological survey identified five special-status insects to have a high potential occurrence at the training ranges, although none were observed. These species are the Sand Mountain serican scarab, Sand Mountain aphodius scarab beetle, Hardy's aegialian scarab beetle, Sand Mountain blue butterfly, and Nevada viceroy (US Navy 1997b).

3.3.5 Sensitive Habitats

The Lahontan Valley supports unique wetlands that include perennial streams (Carson River), perennial freshwater lakes and reservoirs, irrigation canals, and brackish saltwater marshes. The Lahontan Valley thus provides some of the most biologically diverse habitats in the state (USFWS 1995). In the past 25 years, the acreage of wetlands in the Lahontan Valley has ranged from 40,300 in periods of several consecutive years of flooding to 2,400 after a six-year drought. It is estimated that approximately 16,600 acres is the average acreage of wetlands in the region (USFWS 1995). Diversity of vegetation has declined substantially in marshes in the Stillwater and Carson Lake areas within the past 20 years (USFWS 1995). Wetlands in the region, as delineated on National Wetlands Inventory (NWI) maps, are shown in Figure F-1 in Appendix F.

The USFWS defines wetlands in the Lahontan Valley as primary and secondary. Primary wetlands are the wetlands located within the Stillwater National Wildlife Refuge, Stillwater Wildlife Management Area, Carson Lake, and Fallon Indian Reservation. Secondary wetlands are administered or owned by another agency, organization, or individual. The term "secondary" is not an indication of quality or importance of wetland habitat but indicates those that are not designated as Lahontan Valley wetlands under PL 101-618. Secondary wetlands in the region include those associated with the Fernley Wildlife Management Area, Massie and Mahala Sloughs, Soda Lakes, Old River Reservoir, Sheckler Reservoir, Sagoiuspe Dam, Harmon Reservoir, S-Line Reservoir, and Indian Lakes (USFWS 1995).

Although several intermittent creeks, springs, and seeps are found within the proposed withdrawal areas, there are only limited areas of riparian vegetation. Common species in the riparian areas of this region include shrub and tree species, such as willows (*Salix* sp.), salt cedar (*Tamarix* sp.), and Fremont cottonwoods (*Populus fremontii*); grass species, such as creeping wildrye (*Elymus triticoides*) and alkali sacaton (*Sporobolus airoides*); and a variety of wetland species, including sedges (*Carex* sp.), rushes (*Juncus* sp.), and cattails (*Typha* sp.).

Based on NWI maps, wetlands within the proposed withdrawal areas include lacustrine wetlands (playas that form shallow lakes), palustrine wetlands (small marshes and ponds), and riverine wetlands (rivers and streams) during saturated conditions (Appendix F). Sheckler Reservoir, located north of B-16, is classified as a secondary wetland. The reservoir stores only excess water during extremely high river flows, such as in 1995 and 1996. This area may support a variety of waterfowl, shorebirds, colony nesters and marsh species, and raptors. The bald eagle and American peregrine falcon could use this area for roosting and foraging. Although salt and alkali flats are unlikely to meet criteria for jurisdictional wetlands, these areas are included as wetlands on NWI maps and support a wide variety of wildlife during saturated conditions. Many other small springs, ponds, and streams are found within the proposed withdrawal lands during saturated conditions.

3.4 AIR QUALITY

3.4.1 Climate

NAS Fallon and the FRTC are located in an area of the intermountain west, which tends to be dominated meteorologically by recurring high and low pressure systems. Summer is often marked by stationary high pressure systems that develop over the region. These systems augment clear-sky conditions but also can result in large-scale stagnation of underlying air when light wind conditions persist. Winter weather conditions are influenced predominantly by transient storm systems. Precipitation in the vicinity of the proposed withdrawal is limited because the Sierra Nevada Mountain Range, located approximately 50 miles to the west, acts as a barrier. This barrier results in precipitation in the mountains rather than in the lowlands to the east. Precipitation in the region occurs mostly from

December through March. Winter precipitation is typically rain and snow from large-scale weather systems. Summer precipitation is rain, which is often the result of localized activity caused by solar heating, rising air, and associated thunderstorms.

3.4.2 Air Quality

The region of influence for air quality issues varies according to the type of air pollution being discussed. Primary pollutants, such as carbon monoxide and directly emitted particulate matter, have a localized region of influence generally restricted to the immediate vicinity of the source of emissions. Secondary pollutants, such as ozone, have a broader region of influence.

3.4.2.1 Ambient Air Quality Standards

Both Nevada and the federal government have established ambient air quality standards for several different pollutants, often referred to as criteria pollutants (Table 3-2). Nevada's standards are equal to or more stringent than the federal standards. As indicated in Table 3-2, ambient standards for some criteria pollutants have been set for both short and long exposure episodes. Most ambient standards have been set to protect public health, while some state ambient air quality standards may be based on other considerations, such as protecting crops and materials or avoiding nuisance conditions.

Nevada is mandated to identify geographic areas that do not meet federal and state air quality standards. The state uses air quality data gathered by monitoring networks to determine the areas within the state not attaining standards. Areas that violate federal or state standards are referred to as "nonattainment areas" for the relevant pollutants.

3.4.2.2 Existing Air Quality Conditions

In Nevada, the Lake Tahoe Nevada area, Las Vegas area, and Reno area are nonattainment for carbon monoxide; Washoe County (Reno) and Clark County (Las Vegas) are nonattainment for PM_{10}; and Washoe County is nonattainment for ozone (40 CFR Part 81). There are no nonattainment designations for the rest of the state, including Churchill County.

Particulate matter is the only monitored air pollutant in Churchill, Lander, Mineral, and Nye counties. Churchill County monitored total suspended particulates (an earlier standard for measuring particulate matter) from 1971 through 1987. The county started monitoring PM_{10} in 1993. Data from the Churchill County monitoring station indicate that PM_{10} levels are within 24-hour standards (Churchill County 1995).

TABLE 3-2
AMBIENT AIR QUALITY STANDARDS APPLICABLE IN NEVADA

Pollutant	Symbol	Averaging Time	Standard, as parts per million by volume		Standard, as micrograms per cubic meter		Violation Criteria	
			Nevada	National	Nevada	National	Nevada	National
Ozone	O_3	1 Hour	0.12	0.12	235	235	If exceeded	If exceeded on more than 3 days in 3 years
Carbon Monoxide	CO	8 Hours	9.0	9	10,000	10,000	If exceeded	If exceeded more than 1 day per year
		1 Hour	35	35	40,000	40,000	If exceeded	If exceeded more than 1 day per year
Inhalable Particulate Matter	PM_{10}	Annual Geometric Mean	—	—	50	50	If exceeded	If exceeded
		24 Hours	—	—	130	150	If exceeded	If exceeded more than 1 day per year
Nitrogen Dioxide	NO_2	Annual Average	0.05	0.053	100	100	—	If exceeded
Sulfur Dioxide	SO_2	Annual Average	0.03	0.03	80	80	If exceeded	If exceeded
		24 Hours	0.14	0.14	365	365	If exceeded	If exceeded more than 1 day per year
		3 Hour	0.50	—	1,300	—	If exceeded	If exceeded more than 1 day per year
Lead Particles	Pb	Calendar Quarter Average	—	—	1.5	1.5	—	If exceeded more than 1 day per year
Hydrogen Sulfide	H_2S	1 Hour	0.08	—	112	—	If exceeded	—
Visibility	To maintain the prevailing visibility of greater than 30 miles when humidity is less than 70% (state standard only)							

Source: Churchill County 1995

Notes: All standards are based on measurements at 25 degrees C and 1 atmosphere pressure.
Decimal places shown for standards reflect the rounding precision used for evaluating compliance.
National standards shown are the primary (health effects) standards.
Current air quality standards for particulate matter are based on the inhalable component of suspended particulate matter (PM_{10}).

3.4.2.3 Federal Clean Air Act Conformity Process

Section 176(c) of the Clean Air Act requires federal agencies to ensure that their proposed actions are consistent with the Clean Air Act and with federally enforceable air quality management plans. The EPA has promulgated separate rules that establish conformity analysis procedures for transportation-related actions and for other (general) federal agency actions. The conformity review process is intended to ensure that federal agency actions comply with the following:

- Will not cause or contribute to new violations of any federal ambient air quality standards,
- Will not increase the frequency or severity of any existing violations of federal ambient air quality standards, and

- Will not delay the timely attainment of federal ambient air quality standards.

A formal conformity determination is required for federal actions occurring in nonattainment areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. NAS Fallon is not located in a nonattainment area and is therefore not subject to conformity requirements.

3.4.2.4 Air Quality Planning

State of Nevada. Nevada's authority to implement its air quality program is contained in Nevada Revised Statutes (NRS) 445.401 to 445.601, which states the broad powers of the program as follows:

"It is the public policy of the State of Nevada to achieve and maintain levels of air quality that will protect human health and safety, prevent injury to plant and animal life, prevent damage to property, and preserve visibility and scenic, aesthetic and historic values of the State."

Churchill County. While Churchill County has not violated PM_{10} air quality standards, the Churchill County Master Plan stresses the importance of implementing programs to reduce suspended particulates. The plan suggests precautions that can be taken to prevent unnecessary or excessive generation of dust, including sprinkling construction sites; compacting, re-vegetating, and landscaping; chemical palliative or asphalt sealing; installing windscreens to break the wind to agricultural land; imposing reduced speed on dirt roads; limiting burning, tilling, and earth moving at high risk periods; using cargo covers on trucks hauling sand or dirt; and using phased grading and tilling operations (Churchill County 1995).

The Churchill County Master Plan also recommends that programs to reduce vehicular traffic miles must be evaluated to balance anticipated increases in traffic. These programs should include encouraging car-pooling by employers; reviewing potential public transportation, especially between the City of Fallon and NAS Fallon; and planning land uses to minimize divisions between residential areas and areas of services (Churchill County 1995).

3.5 NOISE

3.5.1 Noise Terminology

Sound level meters measure pressure fluctuations from sound waves, with separate measurements made for different sound frequency ranges. These measurements are reported in a logarithmic decibel (dB) scale. Because the human ear is not equally sensitive to all frequencies, the "A-weighted" decibel scale (dBA) is used to weight the meter's response to approximate that of the human ear. As a point of reference, the following are typical decibel levels of common sounds— barren area with no wind, water, insects, or animals, 20 dB; bedroom at night, 30 dB; typical rural area background conditions, 45 dB; typical suburban background conditions, 50 dB; air conditioner at 100 feet, 60 dB; vacuum cleaner at 10 feet, 70 dB; garbage disposal, 80 dB; average crowd noise in an indoor sports arena, 90 dB; and chain saw at three feet, 105 dB. Using an A-weighted decibel scale, 90 dB is four times as loud as 70 dB while 50 dB is one-quarter as loud.

Equivalent noise levels (Leq) are used to develop single-value descriptions of average noise exposure over various periods. Average noise exposure over a 24-hour period often is presented as a community noise equivalent level (CNEL) or as a day-night average noise level (Ldn). CNEL values are calculated from hourly Leq values, with the Leq values for the evening period (7 PM to 10 PM) increased by five dB and Leq values for the nighttime period (10 PM to 7 AM) increased by 10 dB. Ldn values are very similar to CNEL values but do not include any weighting factor for evening period noise levels. The weighting of evening and nighttime noise levels reflects the greater disturbance potential from nighttime noises.

3.5.2 Existing Noise Conditions

Since noise levels decrease as the distance from the source increases, the affected region for noise issues is generally more limited than for other resources. The region of influence for noise issues in this FEIS is Churchill County, specifically the portions of the county surrounding the NAS Fallon training ranges.

The areas of Churchill County that fall within the airspace boundaries associated with NAS Fallon experience generally elevated Ldn noise levels. These levels range from 75 dB near the NAS Fallon station boundary to 65 dB in adjacent areas of Fallon and are primarily the result of aircraft overflights. Noise levels vary in and around the training ranges, from 60 dB outside the ranges to over 75 dB inside the ranges and along flight patterns (SAIC 1991).

Near the training ranges, noise from air-to-ground gunnery cannot be detected because of higher levels of noise from aircraft involved in gunnery activity. Within B-16, only practice/inert and training ordnance are used, producing little noise. Live ordnance dropped on B-17 and B-20 produces 65 dB noise contours at a distance of 6.7 miles from the impact area, while the delivery of explosive ordnance on B-19 produces a 65 dB contour 5.7 miles from the impact area. These data indicate that areas outside the withdrawn ranges are experiencing noise from training activities (SAIC 1991).

3.5.3 Noise Studies

Under a federal program initiated in 1973, under DOD Instruction 4165.57, military air installations are required to analyze the effects of air activities and to provide recommendations for land use planning in adjacent areas that are compatible with air installation operation. In 1977, the Navy conducted an air installation compatible use zone (AICUZ) study to develop a map illustrating noise contours around the air station (US Navy 1977). The study was updated and contours were revised in 1992 (US Navy 1992).

As described in Chapter 1 and shown in Figure 1-6, a RAICUZ study was prepared for the NAS Fallon training ranges in 1982 (US Navy 1982b). The RAICUZ study identified areas contiguous to the established training ranges where noise levels and safety hazard levels exceeded Navy guidelines for the existing land uses. Table 3-3 presents individual land uses and their compatible noise levels. The acceptable noise levels are based on the US Department of Housing and Urban Development document *Aircraft Noise Impact, Planning Guidelines for Local Agencies*; the noise levels have been adjusted down five decibels to take into account the low background noise level in the area.

TABLE 3-3

LAND USE COMPATIBILITY WITH NOISE LEVELS

Land Use	Normally Acceptable Noise Levels
Residential (single family, duplex, mobile homes)	< 60 dB
Residential (multiple family)	< 60 dB
School classrooms, libraries, churches	< 60 dB
Playgrounds, neighborhood parks	< 75 dB
Livestock farming, animal breeding	< 75 dB
Agriculture (except livestock), mining, fishing	< 80 dB
Public rights-of-way	< 75 dB
Extensive natural recreation areas	< 75 dB

Source: US Navy 1982b

Because of changes in aircraft technology and training tactics and in response to public concern, the Navy conducted an aircraft noise study for the B-16 Range Complex (US Navy 1995f). The study calculated and plotted noise levels for average "busy day" operations at the range (Figure 1-4). A busy day is defined as any 24-hour period in which the day's total operations are at least 50 percent of the annual average daily operations. In 1994, B-16 experienced 151 busy days. The noise contours for B-16 are mapped in Figure 5-4 in Chapter 5.

Noise contours defined by these studies have been supported by noise complaints from residents north of B-16 and west of the City of Fallon. Noise complaints stem primarily from high-speed, long run-in overflights by military jets. These types of flights have increased in recent years in conjunction with technological and military training developments. Residential development, which has been extending northwest from the City of Fallon since the early 1950s, has brought an increasing number of people into zones where noise levels have concurrently been on the increase. Most noise complaints have come from owners of private lands adjacent to the proposed withdrawal area, primarily around B-16. NAS Fallon recently revised its training operations around the B-16 range by realigning 12 MTRs to terminate at B-20 instead of B-16, reducing noise levels in the area.

In response to noise complaints, Churchill County adopted a noise ordinance implementing a disclosure statement for existing residences and sound insulation standards for all new residential structures within the 70 dB noise contour of the latest AICUZ studies. Under this ordinance, prospective buyers and tenants within the 70 dB noise contour will receive a notice from the owner disclosing noise conditions at the property. This ordinance also reduces residential construction within the 70 dB noise contour because new construction must contain adequate noise insulation to meet strict county standards (Churchill County 1993; Sugg 1995).

3.5.4 Helicopter Noise

NAS Fallon uses helicopters in its integrated air and ground training mission. Average hourly noise levels above 70 dBA may begin to interfere with outdoor activities, speech, or communication. Peak flyover noise levels above 80 dBA or average flyover event noise levels above 75 dBA would generally be considered intrusive noise events for a normally quiet rural area. Noise levels over 70 dBA make speech communication difficult and speech communication is almost impossible at noise levels over 85 dBA. Intrusive noise events for helicopters may be indicated by peak flyover noise levels above 75 dBA or average flyover event noise levels above 70 dBA.

Table 3-4 illustrates expected noise levels at different distances from the ground track of low altitude (100 feet above ground level) helicopter flights. Noise level estimates in Table 3-4 are presented in several formats: single event levels (SEL), maximum dBA during the flyover event, average dBA during the flyover event, and average hourly dBA for 1 or 5 flights per hour.

TABLE 3-4
ESTIMATED NOISE LEVELS FOR HELICOPTERS[1]

Distance From Flight Track (feet)	Noise Level at Ground			Average Hourly Noise Level (dBA) for Multiple Overflights in One Hour	
	Flyover Event SEL (dBA)	Peak Noise Level (dBA)	Average Event Noise Level (dBA)	1 Flight per Hour	5 Flights per Hour
0	93.7	78.8	74.1	58.1	65.1
100	91.3	76.4	71.7	55.7	62.7
200	88.0	73.1	68.5	52.5	59.5
300	85.6	70.7	66.0	50.0	57.0
400	83.7	68.7	64.1	48.1	55.1
500	82.1	67.2	62.5	46.5	53.5
750	79.2	64.2	59.6	43.6	50.6
1,000	77.0	62.1	57.4	41.4	48.4
1,500	73.8	58.9	54.2	38.2	45.2

[1] Noise levels for a UH60A helicopter at 100 feet above ground level for a duration of 90 seconds.

SEL = single event level (the equivalent noise level if the total acoustical energy of the event is condensed into or spread over a fixed 1-second interval). SEL values for aircraft flyovers are based on Navy data.

Peak noise levels were derived by iteration while scaling the noise event profile to a reported SEL value. Average event noise levels were calculated from the simulated event history.

Average aircraft noise levels were estimated by converting flyover SEL data into a simulated time history profile equivalent to the reported SEL value. For analysis, the flyover event is assumed to include a 1 to 2 nautical mile approach path and a 1.5 to 2 nautical mile departure path during which noise levels will exceed a nominal 50 dBA background level.

Time history simulations assume a 3 nautical mile flight path for helicopters (1.4 nautical mile approach and 1.6 nautical mile departure).

The noise level rise to the peak was simulated as a sine wave curve and the noise level drop-off from the peak was simulated as a logarithmic curve.

3.6 VISUAL RESOURCES

Visual resources in an area are defined by many factors including scenic quality and viewer sensitivity. Scenic qualities provide a descriptive impression of a landscape and include natural features, such as topography, vegetation, water, and soils, and human modifications to an area, such as roads, buildings, and utility lines. Viewer sensitivity can be determined by the angle and frequency of the view and the viewer expectations of the landscape. Other sensitivity factors include the public interest, amount of use, and adjacent land use. Sensitivity levels are a measure of public concern for scenic quality.

As the current managing agency of the lands proposed for withdrawal, the BLM has adopted management guidelines for visual resources in the Lahontan Resource Management Plan. The plan has the objective of managing the lands to protect scenic values and ensuring that visual impacts of management practices and development activities are minimized.

Management actions of the Lahontan Resource Management Plan (RMP) include protecting areas having outstanding scenery as designated by the formal BLM Visual Resource Management (VRM) Program. This process uses assessment and classification procedures to manage visual resources and to reduce impacts of development projects. The Lahontan RMP does not provide a VRM classification of the lands proposed for withdrawal.

The BLM VRM program includes an inventory of BLM-administered lands to determine their visual value. The inventory is based on a scenic quality evaluation, sensitivity level analysis, and delineation of distance zones. Based on these factors, lands are placed in one of four visual resource inventory classes. Classes I and II are the most valued, Class III represents moderate value, and Class IV is least valued. Visual resource inventory classes are used as the basis for considering visual values in the resource management planning process (BLM 1986). While no official classes have been established for the proposed withdrawal area, a BLM visual resource specialist recommended that the lands generally be given an interim Class III rating. In the Job Peak wilderness study area, the lands should be afforded an interim Class II rating (Abbett 1997).

The scenic quality evaluation portion of the visual resource inventory measures the visual appeal of a tract of land. The evaluation includes seven key factors—landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. Based on these factors, the lands are given an A, B, C, or D rating, with Class A lands having the highest scenic quality and Class D lands having the lowest scenic quality.

The scenic qualities of the lands near the training ranges are characteristic of the basin and range area of the western United States. Gold and brown hills diffuse into steep rugged mountains. Alkali flats and low desert brush dominate the valley lowlands, allowing expansive views from the valleys to the surrounding mountains. The higher elevations support sagebrush, juniper, and pinyon pine that provide visual diversity and contrasting darker color along ridgelines in the distant background. Vegetation grows low and evenly on the valley floor and primarily consists of monochromatic desert brush. Cultural modifications in the study area include existing roads, utility lines, radar equipment, including EW, TACTS, and visual cueing device sites, fences, and scattered residences.

Recreation sightseeing inventories completed for the Fort Churchill and Clan Alpine planning units identified the Desert Mountains, Dead Camel Mountains, Sand Springs, and Fairview Ranges as having above common (Class B) scenic values. The southern end of the Stillwater Range was identified as having outstanding (Class A) scenic sightseeing values.

Viewer sensitivity around the training ranges is related primarily to major roads and the Pony Express National Historic Trail through the area because public access to most landscapes within the area is limited. Landscapes with the foreground and middleground view to a distance of approximately five miles from Highway 50, Highway 95, and the Pony Express National Historic Trail generally have a high viewer sensitivity within the withdrawal area. Highway 50 is part of a National Parks Service—proposed National Trails System trail called the American Discovery Trail.

The following descriptions characterize the scenic quality and viewer sensitivity of the lands around the B-16, B-17, and B-19 training ranges as well as for the shoal site and the Dixie Valley area.

At the B-16 training range and proposed withdrawal land surrounding the range, the scenic qualities consist of a relatively flat area with sparse vegetation. Scenic qualities of these lands are overshadowed by the nearby Dead Camel Mountains that visually dominate the proposed withdrawal lands. Highway 95 constitutes the most viewer-sensitive viewpoint because of the number and frequency of viewers with access to this location.

For the proposed withdrawal land surrounding the B-17 training range, the scenic qualities are similar to the B-16 range. The landform includes the relatively flat valley basin surrounded by the nearby ranges. Viewer sensitivity is dominated by long distance views from Highway 50, particularly the eastbound view descending from Sand Spring Pass toward B-17.

At the B-19 training range and the proposed withdrawal land surrounding the range scenic qualities consist of the relatively flat landform with surrounding hills. Viewer sensitivity is relatively low, except for lands adjacent to Highway 95 with foreground views of the lands proposed for withdrawal.

Scenic qualities at the shoal site include the variable hillside landform characteristic of Nevada high desert topography. Viewer sensitivity is low because of the distance from Highway 50.

For the proposed withdrawal land surrounding the Dixie Valley area, the scenic qualities include monochromatic low-lying scrub vegetation on the relatively flat valley floor, surrounded by the extensive hills and mountains of the Stillwater and Clan Alpine mountain ranges. Cattle guards, fences, and EW and TACTS sites are visible in this area. The Job Peak Wilderness Study Area is within a portion of the withdrawal area proposed under Alternatives I and III but not in the area proposed for Alternative II

(Figure 3-1). Viewer sensitivity is dominated by views from Highway 50, particularly the eastbound view descending from Sand Spring Pass toward the Dixie Valley.

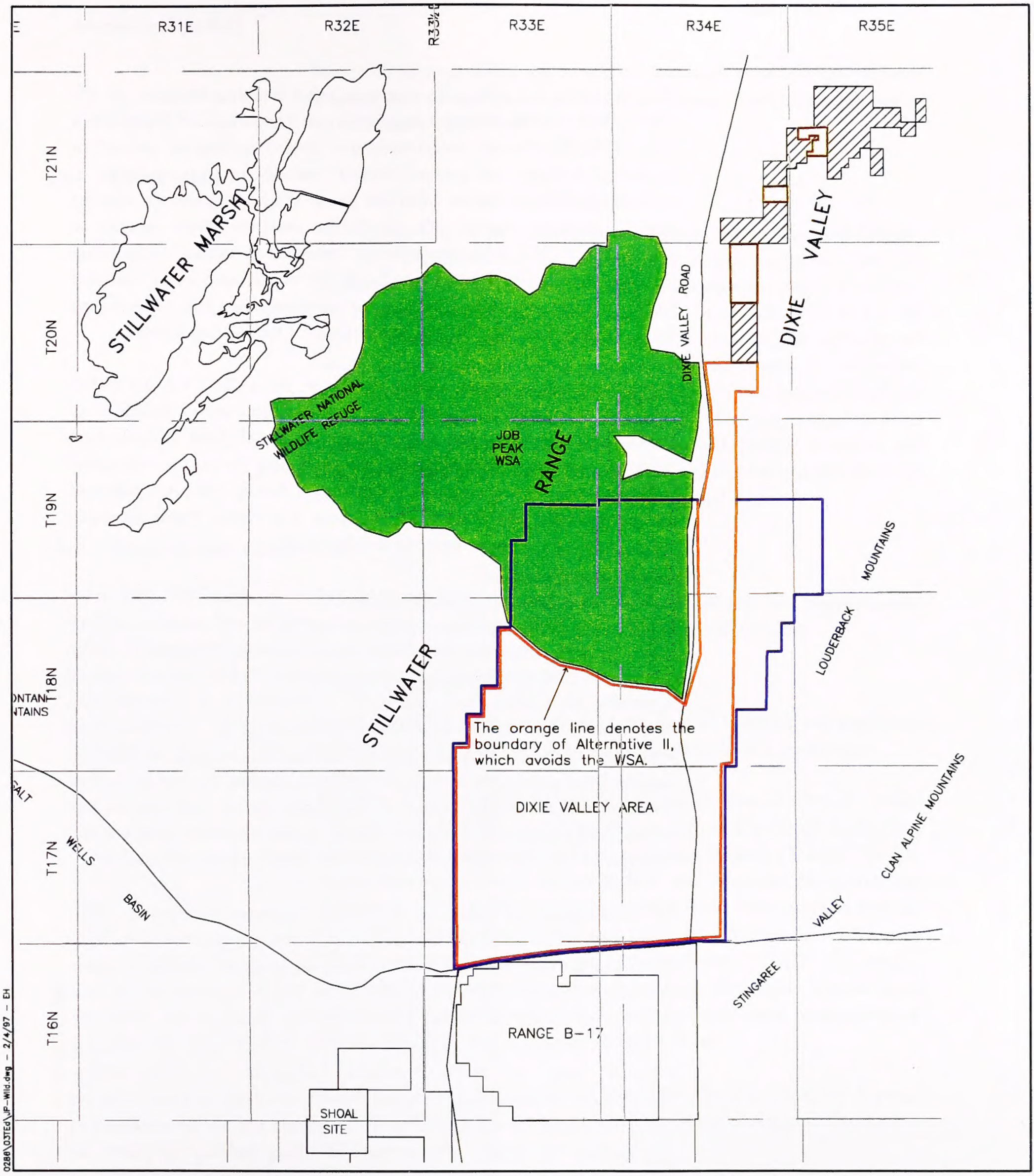
3.7 CULTURAL RESOURCES

Cultural resources is defined as including prehistoric and historic archeological sites and objects, structures, and sites of traditional cultural importance.

There is a long record of prehistoric use of the area. The general region is known to have been occupied since the Late Pleistocene, at least 11,000 to 10,000 years ago, when the Humboldt and Carson Sinks were part of the vast Lake Lahontan system. Sites with deep archeological deposits and long sequences of prehistoric occupation are found around the margins of those ancient lakes and in the then well-watered adjacent valleys and along the lower mountain slopes. Notable among the recorded prehistoric sites on the proposed withdrawal lands are Salt Cave and Eetza Cave. Other notable sites in the vicinity include the Grimes Point National Register Archeological District, which includes the Grimes Point Petroglyph site and the archeological sites at Picnic Cave, Hidden Cave, and Hanging Rock Cave. Recorded archeological sites within the proposed withdrawal lands, based on intensive survey of only a small percentage of the total surface area, number into the hundreds (Intermountain Research 1995). The area was inhabited by Northern Paiute Indians when the first Euroamericans arrived there in the mid-nineteenth century. Those Indians remain in the region, most of them on the Walker River, Fallon, and Pyramid Lake Reservations to the south and northwest of the proposed withdrawal lands. Some traditional cultural practices, such as sweat lodge ceremonies and plant gathering, continue.

Historically, the area has served as a transportation route. The Pony Express National Historic Trail crosses through the area (see Figure 3-12); the Sand Springs Station historic site lies just south of Sand Mountain; and the Wild Cat Freight Station is located approximately six miles northeast of the B-19 withdrawal lands. The project area also has been exploited for furs, minerals, rangeland, and some limited agriculture, and there are archaeological and architectural remnants of those uses scattered through the area.

Cultural resources on lands administered by federal agencies must be treated in a manner consistent with the requirements of the NHPA of 1966, as amended (16 U.S.C. 470), the Antiquities Act of 1906 (PL 59-209) 16 U.S.C. 431-33 (1970), the Archeological and Historic Preservation Act of 1974 (PL 93-291) 16 U.S.C. 469a, the Archeological Resources Protection Act of 1979



The Job Peak WSA is within a portion of Alternatives I and III but not in the area proposed for Alternative II.

LEGEND:

🟩 Job Peak Wilderness Study Area (WSA)

— Extent of Electronic Warfare land areas considered for withdrawal.

— Alternative II (Preferred Alternative)

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(APPROXIMATE)

Areas Proposed for Land Withdrawal Near Job Peak Wilderness Study Area

NAS Fallon, Nevada

Figure 3-1

(PL 96-95) 16 U.S.C. 470aa, the American Indian Religious Freedom Act (42 U.S.C. 1996), and the Native American Graves Protection and Repatriation Act of 1990 (PL 101-601). Under these laws, federal agencies are required to inventory, evaluate, and protect cultural resources of local, regional, or national significance. Native American graves and grave goods are afforded special protection. Section 106 of NHPA requires federal agencies to provide the ACHP the opportunity to comment on federal undertakings that will affect cultural resources eligible for or included in the National Register of Historic Places. Regulations implementing these requirements are set forth in Title 36, Part 800, of the Code of Federal Regulations.

A programmatic agreement among the Navy, the ACHP, and the SHPO has been completed. The agreement stipulates procedures necessary to satisfy NHPA Section 106 requirements on all of NAS Fallon's land holdings for future undertakings, thereby precluding the need for numerous individual requests for comments (pursuant to Section 106). All interested parties, including the Walker River Paiute and Fallon Pauite-Shoshone tribes, have had the opportunity to review the PA.

A CRMP has been prepared for NAS Fallon and the FRTC (US Navy 1993a). The CRMP serves as a database of known cultural resources at NAS Fallon training ranges and withdrawal areas, including a three-mile buffer around the 1982 withdrawal proposal boundaries. These sites are listed in Appendix G (Tables G-1 and G-3). Additionally, it provides the documentation and guidance necessary to ensure timely compliance with applicable laws and regulations assuring appropriate treatment of National Register-listed or eligible historic properties, including but not limited to historical and archeological sites and sites with Native American skeletal remains and associated grave goods. Local Native Americans have had the opportunity to review and comment on the CRMP and the associated PA.

An archeological site prediction model also has been developed for NAS Fallon that covers all of the Carson Desert (Intermountain Research 1995). A five percent sample survey of all existing and proposed withdrawal lands has been conducted to test the model. Table G-3 in Appendix G lists sites documented during the test on Navy lands. The model permits prediction of the archeological site potential of NAS Fallon's lands for planning purposes based on existing ecozone, landforms, or other factors. Descriptions of known and predicted cultural resources on Navy lands are contained within the above-referenced documents and are not reiterated in this section. The model will be used for siting training equipment on withdrawn lands and for establishing areas for ground training activities.

Implementing the CRMP and the PA will follow a general process of having professional archeologists survey the project area to identify cultural resources that might qualify for National Register. The cultural resources identified through the survey would be evaluated, as would the potential impacts, and an appropriate preservation strategy would be developed in consultation with the SHPO.

3.8 LAND USE

NAS Fallon is in the west-central part of Nevada within Churchill County. The City of Fallon is the major community within the project area. The proposed withdrawal areas are associated with training ranges B-16, B-17, and B-19 and the Dixie Valley area and shoal site, which are all part of the FRTC. The major training activities in these areas include air-to-ground bombing, strafing, and rocket practice on fixed targets in withdrawn training ranges; air combat maneuvering practice within designated military airspace in the region; aerial maneuvering and electronic countermeasure training under simulated adversary tracking and defense scenarios; and ground activities on the shoal site landing zone. History and details of the FRTC development are discussed in Chapters 1 and 2.

3.8.1 Proposed Land Withdrawals

The Navy proposes to withdraw between 127,365 and approximately 189,080 acres of public lands for the FRTC as described below.

3.8.1.1 Training Range B-16

The B-16 training range consists of 17,280 acres of land that was withdrawn indefinitely by PLO 898 in 1953. Public access on B-16 is prohibited.

All of the lands proposed for withdrawal around B-16 are federally owned under BLM or BUREC jurisdiction (Figure 3-2), with some of the BUREC lands being administered by the Truckee-Carson Irrigation District (TCID). Under Alternative I, one section of land not proposed for withdrawal (Section 33, R27E, T19N) is privately owned. Some lands north of B-16 are licensed as a flight approach zone, as per a 1964 license executed by the BUREC, accepted by the Navy, and concurred with by TCID. This zone is one mile wide and approximately six miles long. The license requires Navy aircraft to fly at a minimum elevation of 100 feet and limits construction by BUREC and TCID to a maximum height of 25 feet.

All lands proposed for withdrawal would be placed in Category B status except for 640 acres east of the range, which would be placed in Category A status.

3.8.1.2 Training Range B-17

The B-17 training range consists of 21,400 acres of land that was withdrawn indefinitely by PLO 898 in 1953. Public access on the training range is prohibited. Future plans include increased tactical target density, EW site development, and modified target designs.

All of the lands proposed for withdrawal associated with B-17 are federally owned and administered by the BLM. There are existing EW sites on B-17 and lands surrounding the range (Figure 3-3). Some areas of private land east and south of B-17 are surrounded by proposed withdrawal lands. These private lands are associated with patented mining claims (BLM 1986).

All withdrawn lands would be managed under Category A status except for the 2,495 acres proposed only under Alternative I. These lands would be managed as Category B.

3.8.1.3 Training Range B-19

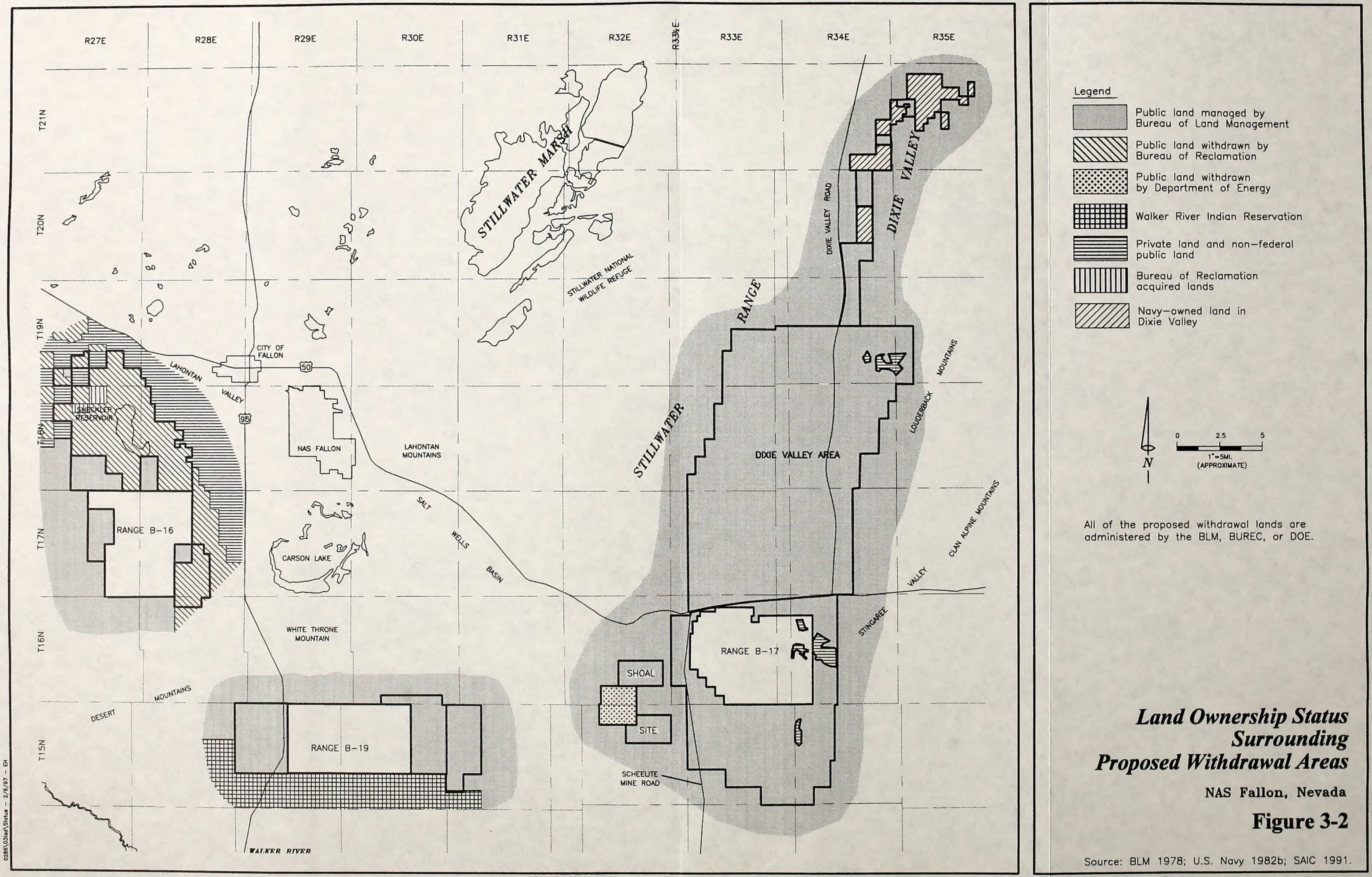
The B-19 training range contains about 17,339 acres of land that was indefinitely withdrawn under PLO 898 in 1953 Public access is prohibited on B-19.

All of the proposed withdrawal lands associated with B-19 are public lands administered by the BLM. Lands immediately south of B-19 are managed by the Walker River Paiute Tribe.

The proposed withdrawal lands containing off-range ordnance would be designated Category A; the remaining lands would be designated Category B.

3.8.1.4 The Shoal Site

No lands currently are withdrawn by the Navy at the shoal site. The proposed withdrawal lands associated with the shoal site are federally owned; approximately 4,640 acres are administered by the BLM, and 2,765 acres are administered by the DOE. The westernmost portion of these lands was the site of an early underground nuclear test explosion in 1963 and is known as the Atomic Energy Commission site. The site was deactivated from nuclear testing in 1964. A preliminary site assessment conducted in 1988 gave the site a Hazard Ranking System score of 3.52, below the minimum score required for listing on the National Priorities List under Superfund. The DOE is characterizing and remediating the surface areas for public use. The subsurface will remain excluded from access (DOE 1996). Prior to the enactment of FLMPA in 1976, the Navy used 4,800 acres of land north and south of the DOE shoal site under a BLM special land use permit. Navy use of the shoal site ended with the termination of the permit.



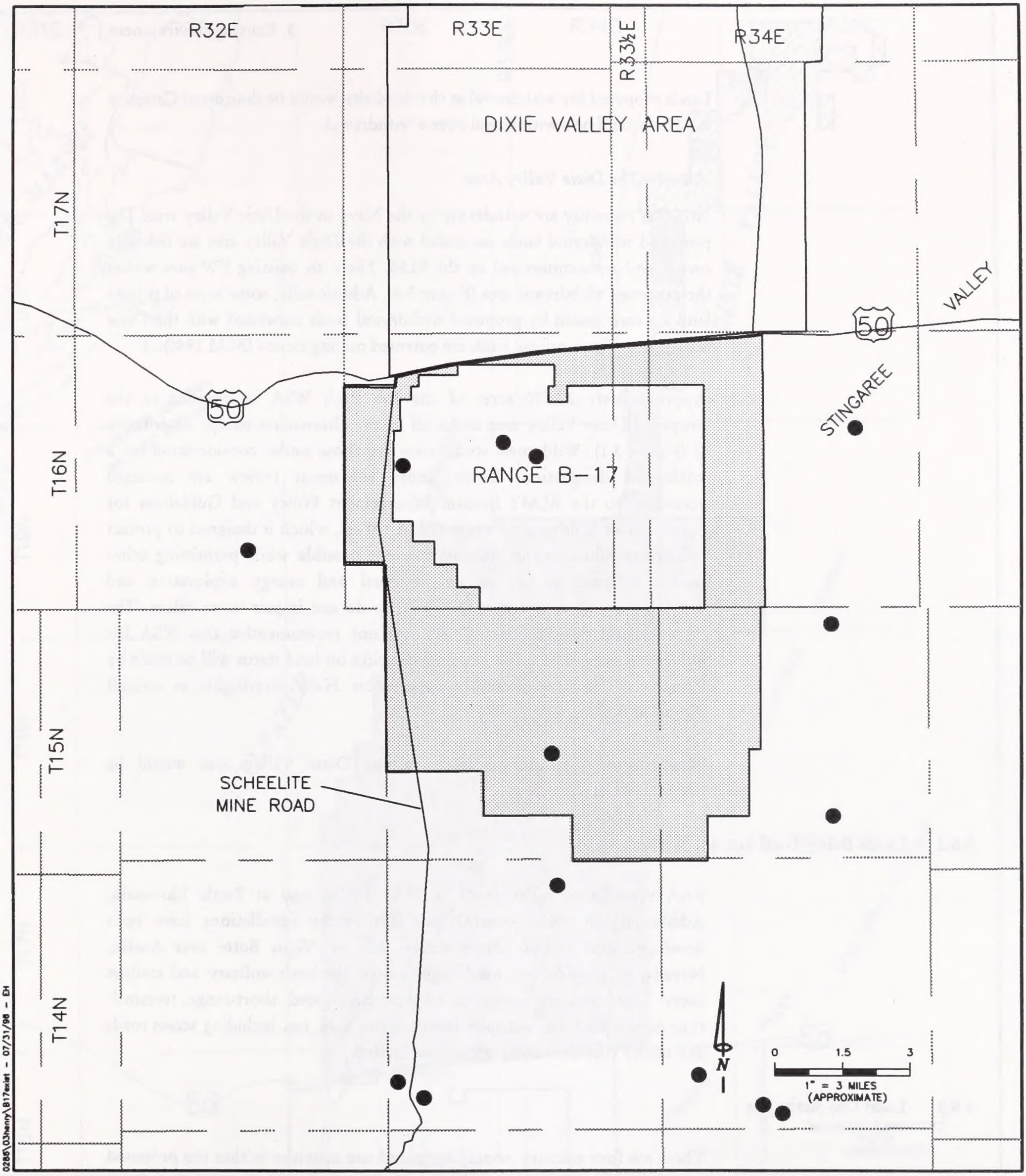
All of the proposed withdrawal lands are administered by the BLM, BUREC, or DOE.

Land Ownership Status Surrounding Proposed Withdrawal Areas

NAS Fallon, Nevada

Figure 3-2

Source: BLM 1978; U.S. Navy 1982b; SAIC 1991.



Existing sites in and around Range B-17 provide electronic warfare capability in this area.

LEGEND:

● Existing EW Sites

▨ Land surrounding B-17 and considered for withdrawal

Existing EW Sites (Range B-17)

NAS Fallon, Nevada

Source: NAS Fallon

Figure 3-3

Lands proposed for withdrawal at the shoal site would be designated Category B. This would be a withdrawal over a withdrawal.

3.8.1.5 The Dixie Valley Area

No lands currently are withdrawn by the Navy in the Dixie Valley area. The proposed withdrawal lands associated with the Dixie Valley area are federally owned and are administered by the BLM. There are existing EW sites within the proposed withdrawal area (Figure 3-4). Additionally, some acres of private land are surrounded by proposed withdrawal lands associated with the Dixie Valley area. These private lands are patented mining claims (BLM 1986).

Approximately 22,390 acres of the Job Peak WSA is included in the proposed Dixie Valley area under all of the alternatives except Alternative II (Figure 3-1). Wilderness study areas are those under consideration for a wilderness designation. Lands under wilderness review are managed according to the BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review (BLM 1979a), which is designed to protect wilderness values to the maximum extent possible while permitting other land uses, such as grazing and mineral and energy exploration and development, to continue as long as they do not impair those values. The BLM Carson City District Office has not recommended this WSA for wilderness designation, but the final decision on land status will be made by Congress. This area presently experiences Navy overflights as aircraft approach B-17.

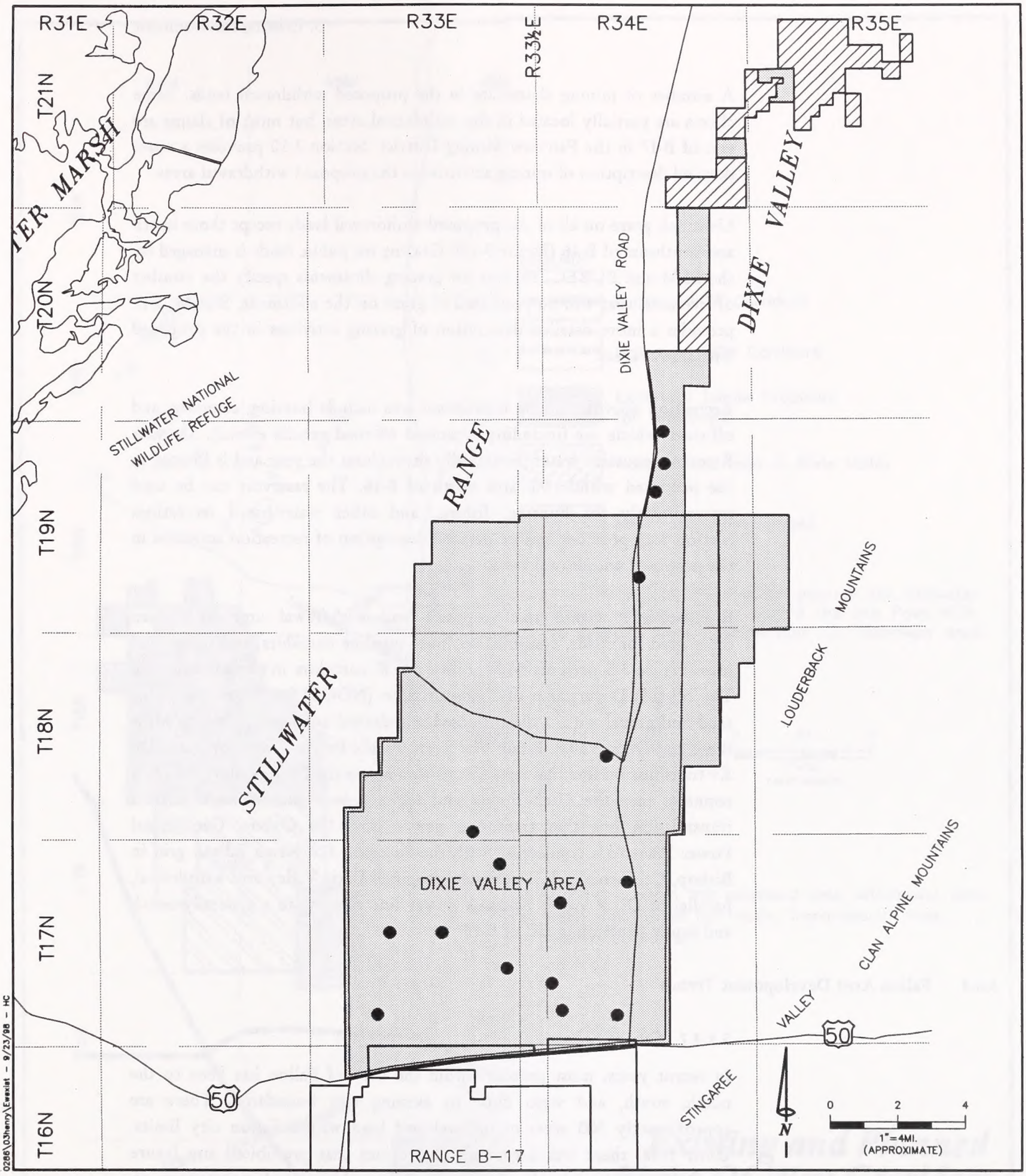
The proposed withdrawal lands in the Dixie Valley area would be designated Category B.

3.8.2 Lands Being Used but not Withdrawn

FAA surveillance radar exists at NAS Fallon and at Battle Mountain. Additional air traffic control gap filler radar installations have been developed near Gabbs, Dixie Valley, and on Vigus Butte near Austin, Nevada, to provide enhanced flight safety for both military and civilian users. These sites are comprised of three high-speed, short-range, terminal-type radars. Each site occupies less than one acre, not including access roads and utility corridors and they are not staffed.

3.8.3 Land Use Activities

There are four primary nonmilitary land use activities within the proposed withdrawal lands—mining, livestock grazing, recreation, and ROWs, easements, and leases.



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EW sites currently extend north into Dixie Valley.

LEGEND:

● Existing EW Sites

▨ Navy-owned Land in Dixie Valley

░ Dixie Valley Area Land Considered for Withdrawal

Existing EW Sites (Dixie Valley Area)

NAS Fallon, Nevada

Figure 3-4

Source: NAS Fallon

A number of mining claims are in the proposed withdrawal lands. Some claims are partially located in the withdrawal areas, but most of claims are east of B-17 in the Fairview Mining District. Section 3.10 provides a more detailed description of mining activities in the proposed withdrawal areas.

Livestock graze on all of the proposed withdrawal lands except those north and southeast of B-16 (Figure 3-10). Grazing on public lands is managed by the BLM and BUREC. Permits for grazing allotments specify the number of livestock that will be permitted to graze on the allotment. Section 3.11 provides a more detailed description of grazing activities in the proposed withdrawal areas.

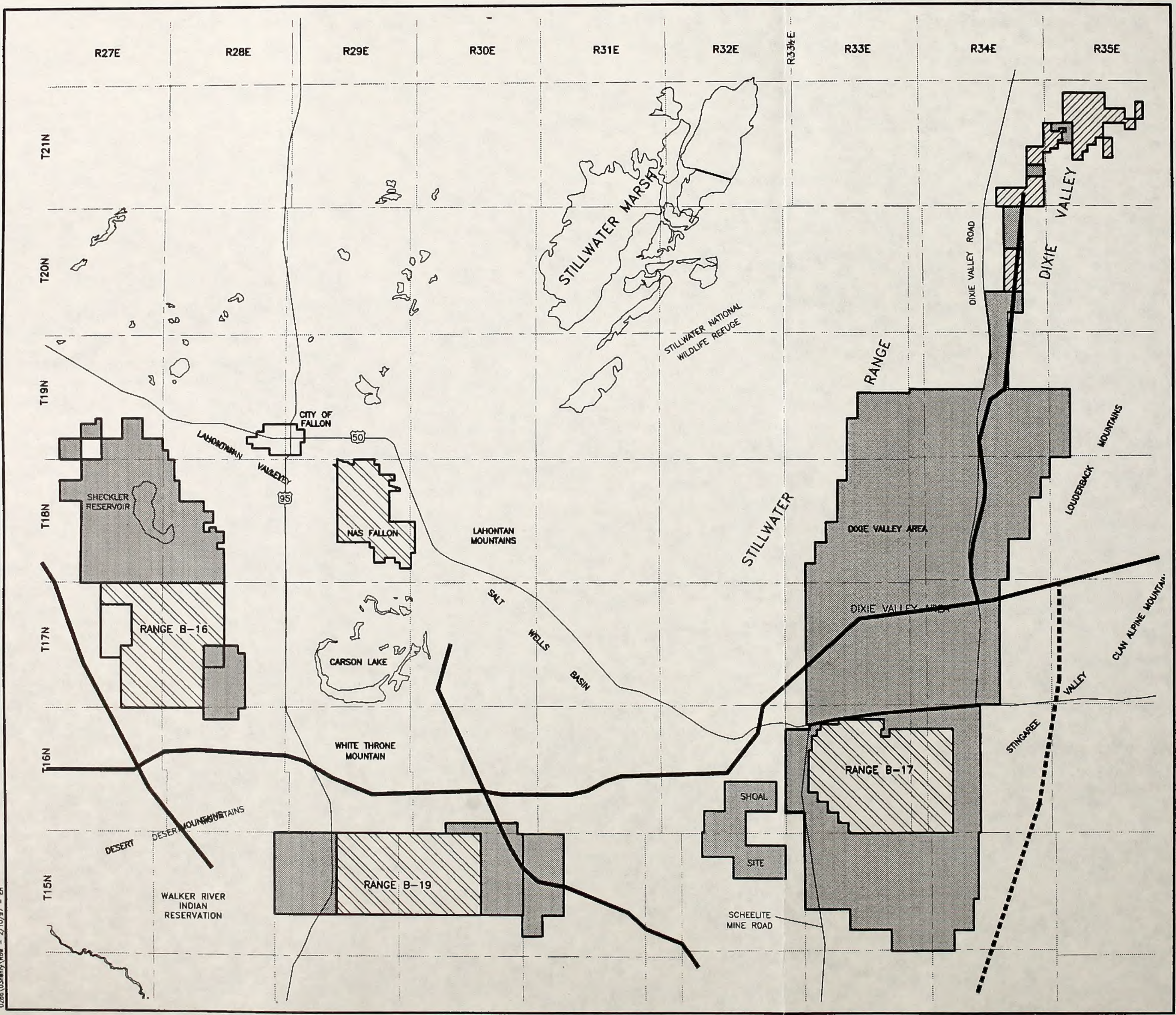
Recreation activities in the withdrawal area include hunting, camping, and off-road vehicle use (including organized off-road vehicle events). Sheckler Reservoir contains water periodically throughout the year and is located in the proposed withdrawal area north of B-16. The reservoir can be used intermittently for hunting, fishing, and other water-based recreation. Section 3.12 provides a more detailed description of recreation activities in the proposed withdrawal areas.

Rights-of-way within the proposed land withdrawal area have been designated for roads, transmission lines, pipeline corridors, and other land uses. Figure 3-5 presents BLM utility ROW corridors in the project area. The Nevada Department of Transportation (NDOT) has borrow sites for sand and gravel within the proposed withdrawal area along Sheelite Mine Road and Dixie Valley Road. The Sierra Pacific Power Company has a 230 Kv transmission line that runs east to west across the Dixie Valley. This line connects into the Utah Power and Light power grid. A portion of a transmission line that transports power from the Oxbow Geothermal Power Plant to a connection with the Southern California Edison grid in Bishop, California, is located in the proposed Dixie Valley area withdrawal, parallel to Dixie Valley Road. A power line running in a generally north and south direction is east of B-19.

3.8.4 Fallon Area Development Trends

3.8.4.1 City of Fallon

In recent years, most growth within the City of Fallon has been to the north, south, and west, close to existing city boundaries. There are approximately 300 acres of undeveloped land within Fallon city limits. Until 1988, there was a general moratorium that prohibited any future annexation of land to the city limits. Before this general moratorium on future annexations, there was a specific moratorium on annexation of land to the west of the present city boundaries. Growth north of Fallon's boundaries is generally constrained by the irrigation canal (White 1995).



LEGEND:

━	Existing ROW Corridors
┅	Proposed ROW Corridors
▩	Extent of Lands Proposed for Withdrawal
▨	Navy-owned land in Dixie Valley
▧	NAS Fallon and Ranges

Note: The utility planning corridor through the Stillwater Range will be granted only if the Job Peak WSA is dropped from consideration as wilderness area.

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Rights-of-way within the proposed land withdrawal area have been designated for roads, transmission lines, and pipeline corridors.

Existing and Planned Right-Of-Way Corridors

NAS Fallon, Nevada

Figure 3-5

Source: BLM, 1985b. Sierra Pacific Power, 1995.

Growth south and east of Fallon is generally constrained by the high water table, which can interfere with development of conventional septic tank systems (Hall 1987). Growth to the east also has been less desirable because of its distance from Reno and Carson City and because of noise levels from nearby NAS Fallon. Locating the city's sewage treatment plant approximately one mile southeast of the city boundaries has increased the development potential by removing the need for septic systems. Currently, the sewage treatment plant has a capacity of 1.2 million gallons per day and a usage level of one million gallons per day (White 1995).

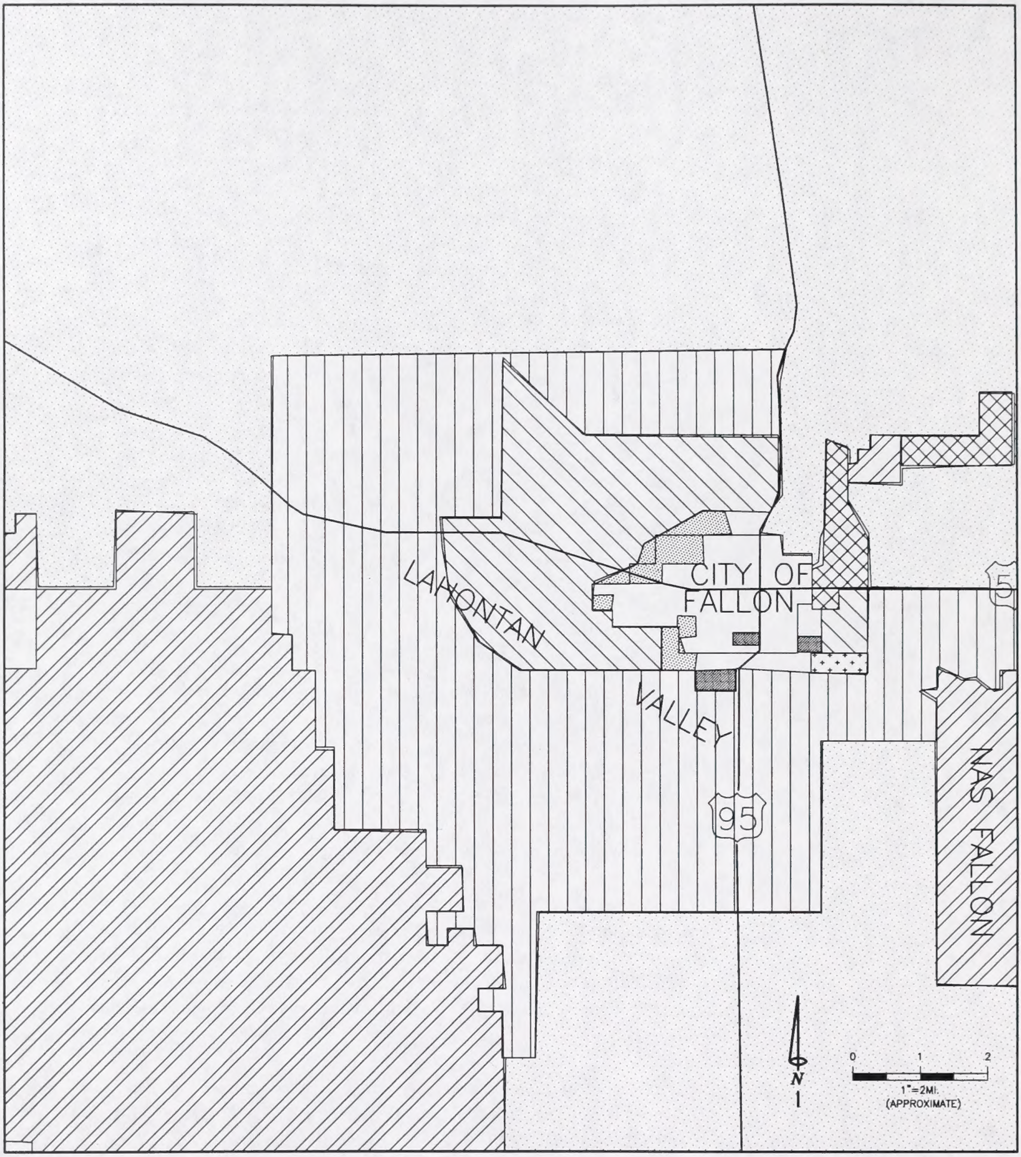
Under reasonably foreseeable economic conditions and growth pressures in Fallon (10 to 15 years), city limits are projected to expand to the Carson River on the north, the TCID canal on the south, the sewage treatment plant on the east, and Coleman Road and the TCID irrigation canal on the west. Once the area within those boundaries is fully developed and if economic and growth pressures increase, then it may become economically viable to annex additional county land into the city limits. Given the proximity of Reno and current county development to the west of Fallon, it is expected that long-term future annexations into the City of Fallon will occur on land west and north of the current city limits (Payne 1995; White 1995).

3.8.5 Churchill County

Growth within Churchill County near Fallon has been primarily west and northwest of the city, northeast of Sheckler Reservoir and along Highway 50 (Figure 3-6). One of the reasons for the growth west is its closer proximity to Reno and Carson City. In recent years, this land has undergone increased parcelization, subdividing, and rezoning from agricultural uses to residential uses (Sugg 1995). Residential growth pressures in this area are expected to remain high.

The area west of Fallon also has a lower water table and sandier soils, both of which are more conducive to the development of conventional septic systems. However, these conditions can vary greatly on a site-specific basis. In addition, the quality of the water in the shallow aquifer in this area is generally better than in other portions of the county surrounding Fallon (Hall 1987).

Growth west of Fallon borders up to public land that is not readily transferable to private ownership and development. The land that BUREC has withdrawn from BLM for the Newlands project (approximately 21,000 acres) cannot be sold or used for other purposes. BLM lands in the area are identified in the Lahontan RMP for retention in public ownership.



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Churchill County expected land use patterns through 2010.

LEGEND:

- ▧ Medium Density Residential
- ▨ Public
- ■ High Density Residential
- ▩ Industrial
- ▒ General Commercial
- ▥ Agricultural/Low Density Residential
- ⁺ Mobile Home Overlay
- ░ Agriculture

Source: Churchill County 1990

Churchill County Master Plan Land Use Designations

NAS Fallon, Nevada

Figure 3-6

Privately owned lands north of Sheckler Reservoir and adjacent to the proposed withdrawal lands at the north of B-16 face development constraints because of a lack of ROWs. TCID roads pass through much of this land but are privately maintained and not considered by the county as legal access for the public. Churchill County will not approve development applications for land owners without legal ROW access through BLM lands (Sugg 1995). This policy discourages private development north of B-16.

3.8.5.1 Land Use and Zoning

The Land Use Element of the Churchill County Master Plan identifies general land use areas indicating anticipated future development patterns. Most of the land surrounding Fallon is indicated for agriculture/low density residential and medium density residential. The land use map is very generalized, reflecting the speculative nature of predicting future growth (Churchill County 1990).

The general concept of the plan is to provide commercial, industrial, and residential expansion in a concentric pattern from Fallon. The element acknowledges that as growth occurs, it may be in the best interest of both the federal government and the county to exchange specific parcels of land to allow consolidation of development for the county and to provide a buffer for a federal agency activity.

The county master plan land use designations for the withdrawal areas associated with Range B-17, B-19, the Dixie Valley area, and shoal site are public and open. The public designation primarily is intended for facilities owned and operated by government agencies, while the open designation primarily is intended for outdoor recreation, agriculture, watershed protection, and sensitive environmental areas. As a secondary use, lands designated open may serve as a buffer between land use types. The public designation is consistent with all zones, and the open designation is consistent with zones A-1, A-1-E, A-2, A-3, and R-R.

The land use designations for the withdrawal areas associated with Range B-16 are public, agriculture/low density residential, open, and agricultural. The public and open land use designations are described above. The agricultural/low density residential (AG/LDR) and agricultural (AG) designations are primarily intended for agricultural uses and single-family dwellings at rural densities. The AG/LDR designation allows a net parcel size of five acres or greater and one single-family dwelling per parcel. The AG designation allows a net parcel size of 20 acres or greater and one single-family dwelling per parcel with additional housing for on-site employees. The secondary uses for AG/LDR lands include home occupations, outdoor recreation facilities, and public and quasi-public uses. Secondary uses for AG designated lands includes crops, animal husbandry, intense animal uses, home occupations, mining, and group quarters. The AG/LDR designation is consistent with zone A-2, while the AG designation is consistent with zone A-3 (Churchill County 1990).

Most of the land between the western Fallon city limits and B-16 is zoned by the county as second agricultural (A-2), third agricultural (A-3), and rural resources (RR) (Figure 3-7). Land near the western edge of Fallon is zoned first estates (E-1), single-family residential (R-1), multiple residential (R-2), transitional residential-commercial (C-1), and general commercial (C-2). The land withdrawal area associated with Range B-17, B-19, the shoal site, and the Dixie Valley area is zoned R-R. The zoning classifications for the withdrawal areas are consistent with the master plan land use designations for these areas, described above (Churchill County 1995).

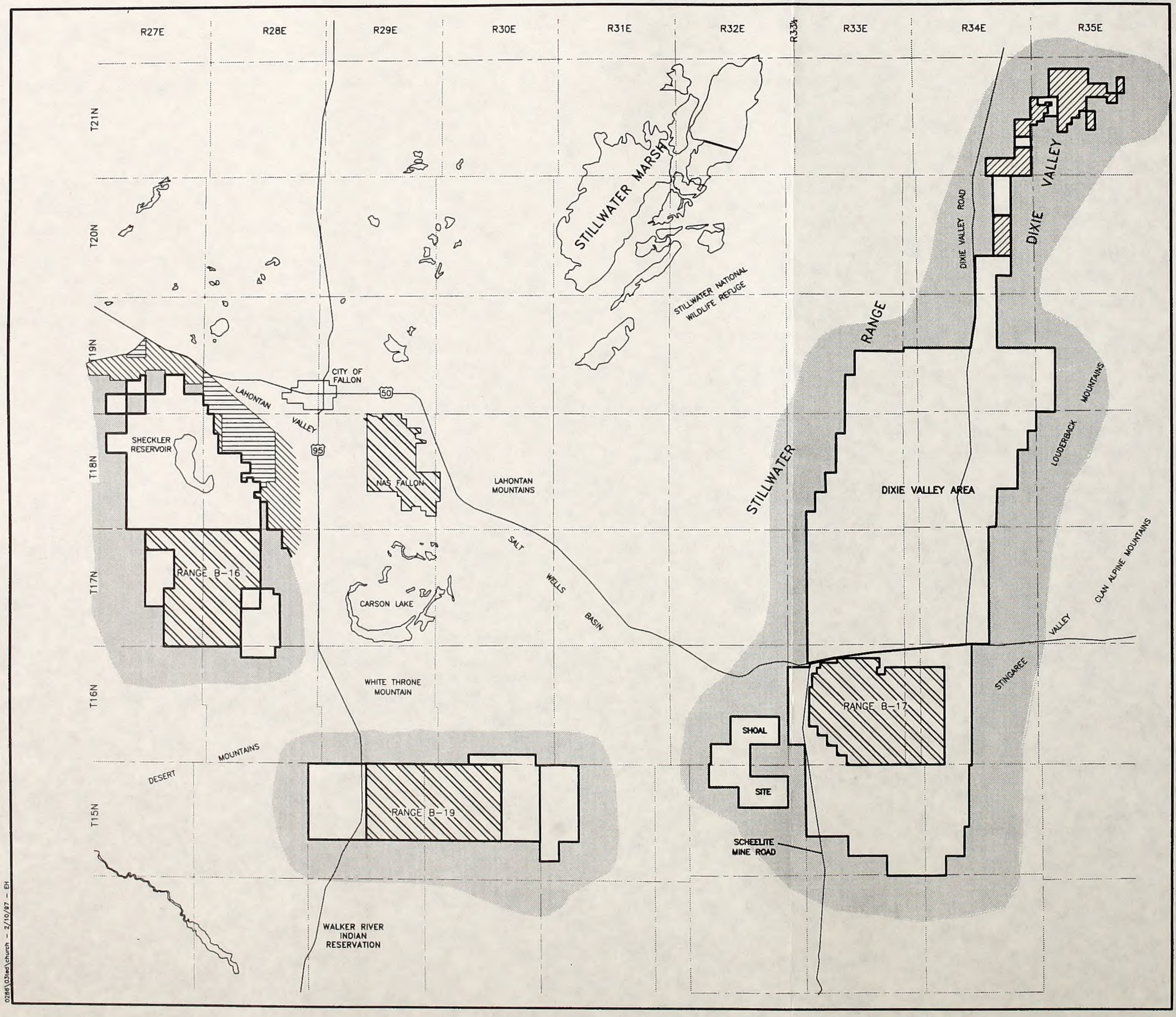
Parcels zoned A-2 must have a minimum area of five acres, and lands zoned A-3 must have a minimum area of ten acres. Permitted uses of A-2 and A-3 lands include single-family dwellings and farms for raising livestock and field crops. Specially permitted uses include education, recreation, rock and gravel mining, transmission lines, and game refuges (Churchill County 1984).

Land zoned R-R has a minimum area requirement of 20 acres. The R-R classification applies to all unincorporated county lands not otherwise classified and is intended to "protect and enhance all natural resources, including historical and archeological sites." Permitted uses are the same as those for lands zoned A-3 (Churchill County 1984; Sugg 1995). The county has identified military overflight and noise zones as land use constraints in determining residential land uses (Churchill County 1990). This consideration of public health and safety relative to the FRTC may discourage higher density development west of the bounds of the water-righted properties.

3.8.5.2 Land Development Process

In Churchill County, the division of land parcels for development can be accomplished by parceling into four or fewer pieces or by subdividing into five or more pieces. The subdivision process requires a review and approval by the State Health Division to ensure that adequate conditions exist for water supply and septic systems. While such a review is not required for the parceling process, the State Health Division does review applications forwarded by the county (Sugg 1995).

The county also requires that access to any parcel of ten acres or less be paved and connected to a county-maintained road. Previously,



LEGEND:

▨ Navy–owned land in Dixie Valley

▨ NAS Fallon and Ranges

Zoning Designations

▒ RR, Rural Resources

▨ A3, Third Agricultural

▤ A2, Second Agricultural

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(APPROXIMATE)

Most of the land around the proposed withdrawal area is zoned rural resources except as indicated north of B-16.

Churchill County Zoning for Land Surrounding Withdrawal Areas

NAS Fallon, Nevada

Figure 3-7

Source: Churchill County, 1990; U.S. Navy 1995b.

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developments were not necessarily connected to county-maintained roads, and those developments would not be serviced by county school buses or the Postal Service (Sugg 1995).

As discussed in Section 3.5, Churchill County adopted a noise ordinance in 1993, requiring disclosure and noise insulating standards for property transactions and residential developments. This ordinance reduces development in areas affected by aircraft noise in excess of 70 Ldn (Sugg 1995).

3.9 ENVIRONMENTAL JUSTICE AND SOCIOECONOMICS

3.9.1 Population

The community nearest to NAS Fallon is the City of Fallon, which had a population of 6,438 inhabitants in 1990 (US Census 1990). Fallon is a service-oriented city for the surrounding ranching and farming interests and NAS Fallon. Employment in Fallon derives from government and support services, construction, manufacturing, retail trade, ranching, farming, mining, and tourism. The agricultural development is supported with water from the BUREC's Newland's Reclamation Project.

The City of Fallon is also the seat of Churchill County and defines the project region of influence (the proposed land withdrawal areas are entirely within Churchill County). The current county population is 17,938 inhabitants (US Census 1990), with about 95 percent of that population living in the City of Fallon or within a 10-mile radius of the city. The federal government administers 82 percent of the land in Churchill County (Churchill County 1994). Churchill County population increased from 13,917 in 1980 to 17,938 in 1990. As shown in Table 3-5, Churchill County population increases are projected to continue during the period from 1995 to 2000. Nevada has estimated that the 1995 population was approximately 21,000 and will rise to between 23,800 and 28,400 by 2000 (Nevada State Demographers Office 1993). These population increases are expected to continue the current growth trends in the Fallon area.

The Walker River Indian Reservation is adjacent to the southern boundary of the B-19 training range. The community of Schurz, approximately 17 miles south of B-19, is located on the reservation. Schurz has a population of approximately 800.

There are no residences within the HAZARD footprints of the ranges. As discussed in Section 1.4.3.2, there are 12 residences under the extreme northeast corner of the RAICUZ range safety zone C at B-16. It is estimated that 31 people reside in this area. Census data do not indicate their racial and income status.

TABLE 3-5
CHURCHILL COUNTY POPULATION ESTIMATES 1995-2000

Year	Population Estimates	
	Low	High
1996	21,630	22,270
1997	22,240	23,520
1998	22,800	24,720
1999	23,320	27,800
2000	23,830	28,410

Source: Nevada State Demographer's Office, Bureau of Business and Economic Research, College of Business Administration, University of Nevada, Reno

3.9.2 Environmental Justice

Pursuant to Executive Order 12898 ("Environmental Justice"), Chapter 4 of this document discusses possible adverse disproportionate effects on minority and low-income populations in the region of influence resulting from the project alternatives. Current background information on minority groups is provided below to assist in the Chapter 4 discussion. The 1980 and 1990 racial breakdown of Churchill County is detailed in Table 3-6 and shows that whites made up 90.9 percent of the population in 1980 and 89.4 percent of the population in 1990. These figures show increasing representation among minority groups between 1980, and 1990 and although this trend may have continued through 1995, whites continue to constitute the vast majority of Churchill County residents (US Census 1980; US Census 1990).

TABLE 3-6
RACIAL BREAKDOWN OF CHURCHILL COUNTY 1980 AND 1990

Race	1980 Census	Percentage of Total	1990 Census	Percentage of Total
Total	*13,917*	100.0	*17,938*	100.0
White	12,654	90.9	16,028	89.4
Black	95	0.7	203	1.1
Native American	666	4.8	895	5.0
Asian or Pacific Islander	304	2.2	466	2.6
Other race	198	1.4	346	1.9

Source: US Census 1990; US Census 1980

Located near Fallon is the Paiute-Shoshone Tribe of the Fallon Reservation and Colony. The colony consists of 60 acres, two miles northeast of Fallon, and the reservation consists of over 8,000 acres, twelve miles northeast of Fallon. Approximately 30 miles south of Fallon is the Walker River Indian Reservation, consisting of over 320,000 acres; 42,000 of these acres are within the socioeconomic region of influence.

3.9.3 Employment and Income

The largest sector of Churchill County's economy in terms of income and employment is the federal government, and most of that employment is attributable to NAS Fallon, which has been a mainstay of the county's economy since the late 1940s. In 1994, NAS Fallon directly accounted for 2,330 jobs, which is nearly 30 percent of the county's total employment. These jobs include 984 military positions, 603 civil service positions, and 743 contractors. In terms of total payroll in the county, the Navy and contractors at NAS Fallon accounted for approximately $84 million in 1994. Of this total, Navy salaries accounted for $59.5 million and contractors salaries for $24.6 million. An unknown but probably small portion of the contractor payrolls should be revised downward to account for workers completing assignments and then leaving Churchill County (US Navy 1995i).

Agriculture and mining are also important in the county's economy. Agriculture accounted for about four percent of Churchill County income and about seven percent of total employment (BEA 1991). The mining industry constitutes an important but relatively small part of Churchill County's economy. It accounts for approximately one percent of the economy by income and about two percent of the county employment (BEA 1991).

3.9.4 Local Government

As with other local governments in the area, Churchill County has had increasing financial problems in recent years because of reductions in the property tax level and less than projected sales tax revenues. Total county revenues for fiscal year ending June 30, 1990, were $7,446,273. Payment in lieu of taxes from the federal government to Churchill County for fiscal year 1990 amounted to $455,000, or approximately 6.1 percent of total county revenues. These payments to counties are determined by a formula, using data on public land acreage and county population. The payments to Churchill County are dependent primarily on county population.

Another income source to local governments are taxes assessed on commercial airlines that use the airspace within county boundaries. In fiscal year 1995-1996, the assessed valuation of airspace in Churchill County was $3.3 million (Nevada 1996).

3.9.5 Mining Contribution to Local Economy

As noted in Section 3.10.2, mineral evaluations were conducted for potential mineral resources in the areas proposed for withdrawal. One of the evaluations, conducted by the US Bureau of Mines (BOM), contained a socioeconomic study of three mineral deposits in the original 181,323-acre study area (US BOM 1992). The study revealed that if the mines analyzed were to be developed, they could result in the total immigration of 2,530 people (operation workers and their families) to fill permanent jobs. The annual tax revenues could be approximately $60 million, which would be used to supply services to the immigrating workers. The sectors most affected indirectly would be recreation-gaming, agriculture-food, and small fuel distributorship industries. Costlier purchases, such as explosives, fuel, tires, parts, and plant supplies, likely would be made outside of Churchill County (US BOM 1990).

A second study of the mineral potential of 7,750 acres in the area of B-16, B-17, and B-19 was completed in 1992, but its authors were unable to analyze the socioeconomic value of these acres (US BOM 1992). This study is further discussed in Section 3.10.7.

3.10 MINERAL RESOURCES

This section discusses the mineral resources and mining activity within the withdrawal land area encompassing the project alternatives.

3.10.1 Mineral and Mining Studies

The Nevada Bureau of Mines and Geology (NBMG) prepared a Mineral Resource Inventory for the 181,323 acres identified for withdrawal under the RAICUZ study in January 1987, referred to in this document as the 1987 NBMG report. The Department of the Interior, Bureau of Mines, completed Mineral Resource Evaluations for the RAICUZ withdrawal land (US BOM 1990), for the 7,750 acres of off-range ordnance land added to the proposed withdrawal (US BOM 1992), and for the 7,584-acre panhandle area proposed for withdrawal in Alternatives II and III to connect the Dixie Valley area to the Dixie Valley land holdings (US BOM 1995). An additional survey was completed for the area south of B-16 proposed for withdrawal under Alternative II (Thompson 1996). The findings of these reports are detailed below.

3.10.2 Types of Mineral Commodities in the Withdrawal Area

Mineral commodities are grouped by law into locatable minerals, leasable minerals, and salable minerals. Examples of locatable minerals in the project area include gold, silver, tungsten, fluorite, copper, lead, zinc, and uncommon varieties of limestone and other minerals having unique and special values. Leasable minerals include oil and gas, geothermal resources, and solid leasable minerals. Salable minerals are common varieties of sand, stone, gravel, pumice, pumicite, cinders, and clay (US BOM 1990).

3.10.3 Mineral Districts

The following discussion of mineral districts was excerpted from the 1987 NBMG report. The proposed land withdrawal referred to is the 181,323 acres recommended for withdrawal under the RAICUZ study.

"Portions of seven mining districts or recognized mining areas are included within the boundaries of the proposed land. Districts that are most affected by the land action are the Fairview and Wonder districts on the east side of Fairview-Dixie Valley. At Fairview, the major mining area is outside of the withdrawal boundary but possible extensions of mineralized ground could be within the [proposed withdrawal] area. Most of the South Fairview district (a sub-district within Fairview) is included in the withdrawal. To the north, all of the western Wonder district (the Victor area) is included within the land withdrawal. Only a small portion of the Chalk Mountain district is affected and, on the west side of Fairview-Dixie Valley, extensions of both the La Plata and Sand Springs districts fall within the withdrawal boundary. To the west, two other mining areas fall within areas scheduled for [withdrawal]; the Cinnabar Hill portion of the Holy Cross district, Barnett Hills, and the Camp Gregory area on the northeast flanks of the Dead Camel Mountains. These two areas have not been important mineral producing areas in the past but both have been sites of recent mineral exploration."

Of the 7,750 acres of off-range ordnance land added to the withdrawal area in 1989, only the land east of range B-17 was in a mining district (northern Fairview District). The lands east and south of B-16 and north of B-19 were not in mineral districts (US BOM 1992; Thompson 1996). The panhandle area crosses the northern corner of the Wonder mining district. Figure 3-8 depicts the seven mining districts in the proposed land withdrawal area.

3.10.4 Appraisal of Mineral Resources

The discussion below is excerpted from the 1987 NBMG report. The project area referred to is the 181,323 acres recommended for withdrawal under the 1982 RAICUZ study.

"Identified mineral resources within the area include: a possible 1.8 million tons of open-pit gold ore at the Jet prospect, Fairview district; an unknown tonnage of open-pit silver ore on the Silver Center claims, Wonder district; and an unknown quantity of diatomite at the Wildhorse claims, Camp Gregory area. In the northern Fairview district, the tailings of the Nevada Hills Mine also constitute an identified mineral resource. These areas are shown on [Figure 3-9].

"Several areas within the proposed withdrawal area have moderate to high potential for the discovery of mineral deposits. These areas are generally adjacent to known mines and mineralized ground in the mining districts bordering the withdrawal. Areas of moderate precious metal potential occur in parts of the Fairview, La Plata, and Holy Cross districts, and in the Camp Gregory area; areas of high precious metal potential occur in the Fairview, Wonder, Sand Springs, and Holy Cross districts.

Areas in the Chalk Mountain, La Plata, and Sand Springs districts contain moderate potential for other elements including base metals, tungsten, and molybdenum. Two areas, one in the Wonder district and another in the La Plata district, have moderate potential for discovery of fluorite deposits. One area, south of Camp Gregory, may have moderate potential for diatomite."

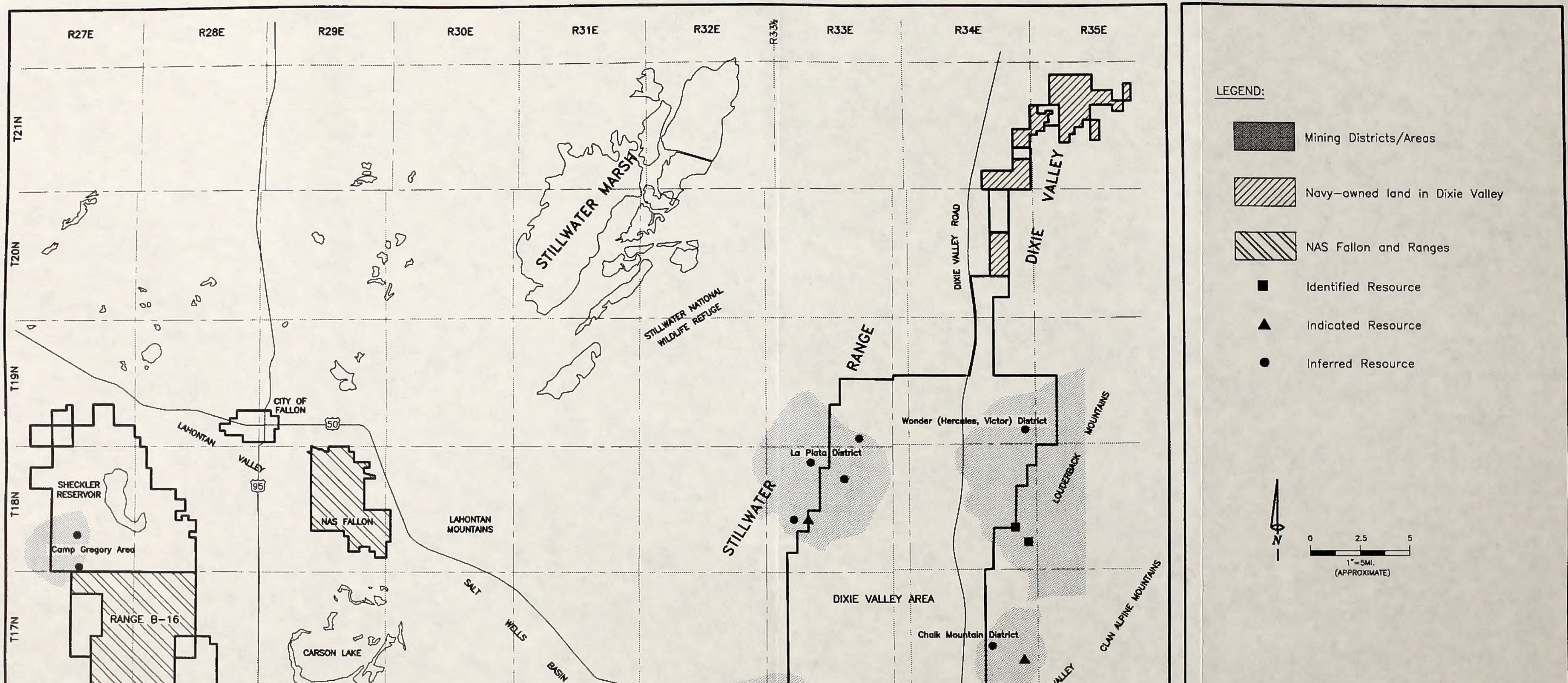
The 1990 BOM report referenced the same findings as the 1987 NBMG report. The 1992 BOM report supplemented information found in the 1990 BOM report and the 1987 NBMG report regarding diatomite resources south of the Camp Gregory mining district (west of B-16). This area was identified as having an unknown quantity of diatomite. The 1992 BOM report quantifies this resource, estimating a 20-year production capability at 40,000 tons per year, as discussed in Section 3.10.7 of this report.

The 1992 BOM report identified no areas of moderate to high mineral potential in the 7,750 additional acres proposed for withdrawal. The 1995 BOM report stated that the economic potential of the panhandle area is limited to sand and gravel and possibly clay deposits. The 1996 report identified no areas of moderate to high mineral potential in the proposed withdrawal lands south of B-16.

3.10.5 Geothermal and Petroleum Resources

The Mineral Resource Inventory Report also assessed geothermal and petroleum potential.

"Data from thermal springs, water wells, and geothermal exploration wells have been used to define areas of the state that have potential for



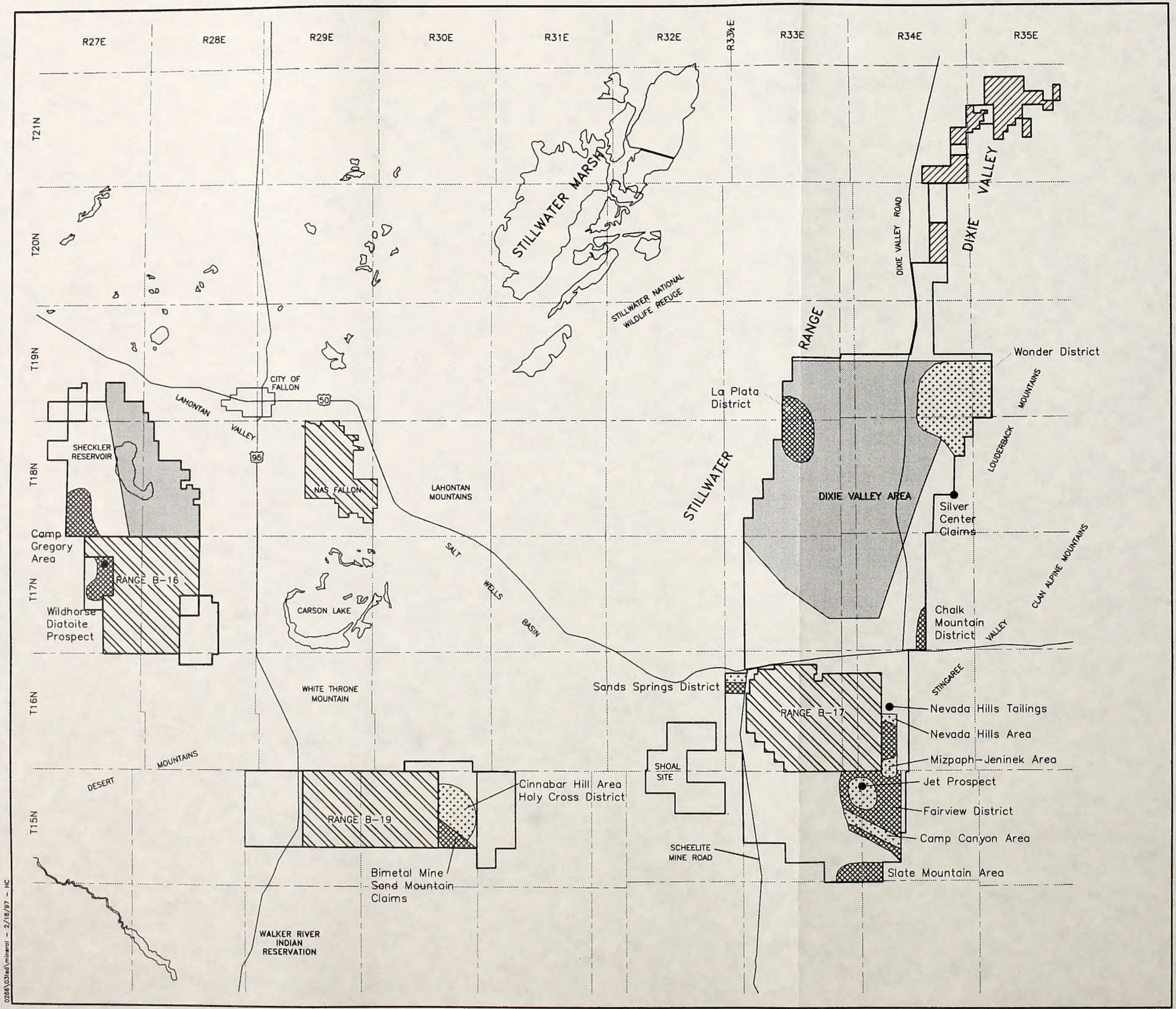
Mineral evaluations have occurred at most of the seven mining districts located within the withdrawal boundaries.

Mining Districts

NAS Fallon, Nevada

Figure 3-8

Source: Nevada Bureau of Mines and Geology, 1987



LEGEND:

▧ NAS Fallon and Ranges

Mineral Potential

● Identified Mineral Resource

▦ Area of Moderate Mineral Potential

▒ Area of High Mineral Potential

▨ Navy-owned land in Dixie Valley

Petroleum Potential

░ Low Petroleum Potential

Geothermal Potential

Geothermal potential for the entire area of withdrawal is only speculative.

N

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(APPROXIMATE)

The study area was evaluated for mineral, petroleum, and geothermal potential.

Mineral Resources

NAS Fallon, Nevada

Figure 3-9

Source: Nevada Bureau of Mines and Geology, 1987; U.S. Bureau of Mines, 1990 and 1992

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geothermal resources (Garside and Schilling 1979; Trexler et al. 1983). In the areas considered for [withdrawal] in Churchill County, only two have potential, based on presently available data. The southern part of Dixie Valley has been explored for geothermal resources. No more exploration has been attempted in the area, and it is doubtful if any is planned. Oxbow Geothermal Corp. has developed a major geothermal resource in northern Dixie Valley, 30 miles to the north, but has no plans to do more work in the southern-most part of the valley.

"A second proposed [withdrawal] area that is near a geothermal resource is located adjacent to US Highway 95, about 20 miles south of Fallon and 1 mile southwest of Lee Hot Springs. There is no known subsurface information in this area that would suggest that the proposed [withdrawal] has anything other than a speculative geothermal potential.

"Most of the areas in Churchill County considered for [withdrawal] are believed to have very low potential [for petroleum resources], except for the area of southern Dixie Valley. Southern Dixie Valley is believed to have a low but significant petroleum potential because the area is underlain by the adjacent rocks that may be potential sources of petroleum. Oil and gas leases [have been] staked in southern Dixie Valley. There have been no petroleum exploration wells drilled in southern Dixie Valley and none are known to be planned in the near future."

The 1987 NBMG report and the 1990 BOM report identified seven active oil and gas leases within the proposed withdrawal area. These leases have since been terminated, five in 1988 and two in 1989. No oil and gas leases were reported in the study of the 7,750 acres added to the withdrawal footprint.

The 1995 BOM report identified some past activity but only one current oil and gas lease in the panhandle area. No oil and gas leases were reported in the area south of B-16 evaluated in the 1996 report.

3.10.6 Other Nonmetallic Mineral Resources

The discussion below is excerpted from the 1987 NBMG report.

3.10.6.1 Sand and Gravel

"Much of the alluvial-covered areas along the lower flanks of the proposed withdrawal area contain potential sand and gravel reserves. This material, however, does not have any unique value over similar material occurring in other areas throughout western Nevada, and its potential cannot be rated. As in the past, sand and gravel operations in Nevada will continue to be developed as close to consuming areas as possible."

3.10.6.2 Sodium and Potassium Compounds

"Sodium compounds have been produced from Fourmile Flat, west of the Sand Springs Range, and from Soda Lake, west of Fallon. Borates have been mined from Eightmile Flat west of the salt mine area. The lands within the proposed withdrawal area, however, do not contain closed basins that might have potential for any saline minerals, carbonates, or borates."

3.10.7 Potential Mineral Developments

The 1990 BOM report, like the 1987 NBMG report, addressed significant mineral commodities known to be within or adjacent to lands potentially affected by the withdrawal. The BOM report differed from the NBMG report in that it provided an economic assessment of the five major nonproducing deposits in the proposed withdrawal area. The report's authors developed capital and operating cost estimates and socioeconomic effects (employment, taxes, and cash flow) associated with economic ore deposits. They developed a mine/mill model based on mining and milling operations currently active in the region.

The modeled properties are the Elusive gold mine (La Plata District), the La Plata tungsten/molybdenum mine (La Plata District), and the Summitt King gold/silver/lead mine (Sand Springs District) (Figure 3-8).

The models assumed the tonnage and grade of the deposits, the mining and processing methods, resulting products, production rates, and construction and operation costs (Table 3-7). The models estimated the change in final total demand (personal consumption, investment, government expenditures, and foreign exports). They estimated changes in population and employment (direct, indirect, and induced) in Churchill County associated with these potential mines (Table 3-8). The population growth describes the immigration of workers and their families to Churchill County; commuters are not included as population growth. The model also estimated capital investment costs, operating costs, and tax revenues that would be generated in the study area (Table 3-9). The tax revenue includes Nevada state proceeds from mine taxes, federal income taxes, property taxes, and sales and use taxes.

The 1992 BOM report of the mineral potential of the additional 7,750 acres added to the withdrawal identified a land area west of B-16 (land use Category B) with potential diatomite resources with at least a 20-year production capability at the rate of 40,000 tons per year. Based on prices obtained from area producers of diatomite, and depending on the final product, the resource would have an estimated value ranging from $100 to $350 per ton. The gross value of the annual production rate of 40,000 tons would range from $4 million to $14 million per year.

TABLE 3-7
ESTIMATED MINE DEVELOPMENT, CONSTRUCTION, AND OPERATING COSTS ($ MILLION IN 1990 DOLLARS)

Deposit	Construction Costs[1]	Operation		Land Use Control
		Annual (for 1st Year)	Cumulative[2]	
Elusive	39.3	20.5	225.5	B
La Plata	23.7	9.6	153.6	Outside Withdrawal
Summit King	21.7	3.6	28.8	Outside Withdrawal

Source: US Bureau of Mines 1990

[1] Excludes working capital

[2] 20 years or deposit life

TABLE 3-8
CHANGES IN POPULATION AND EMPLOYMENT IN CHURCHILL COUNTY AS THE RESULT OF MINE DEVELOPMENT

Deposit	New Employment[1]		Population Growth[2]	
	Construction	Operation	Construction	Operation
Elusive	66	240	523	1,924
La Plata	30	82	243	248
Summit King	69	36	240	358

Source: US Bureau of Mines 1990

[1] Includes direct, indirect, and induced jobs

[2] Includes workers and their families

TABLE 3-9
POTENTIAL TOTAL TAX REVENUES[1] ($ MILLIONS IN 1990 DOLLARS)

Deposit	Nevada State Proceeds of Mine	Federal Income Tax	Property Tax	Sales & Use Tax	Total
Elusive	1.2	8.3	5.8	9.0	24.3
La Plata	1.1	7.3	4.2	4.8	17.4
Summit King	.9	6.5	1.3	1.5	19.2

Source: US Bureau of Mines 1990

[1] Based on price levels required for a 15 percent rate of return

The report's authors were unable to complete a socioeconomic assessment on the diatomite resource because they did not know what type or grade of diatomite products would be produced, and grade determines prices. The authors also did not know which market the owners would enter, and market determines production level and therefore equipment costs of both mining and processing (US BOM 1992).

The 1995 BOM report concluded that the potential to develop metallic or clay resources in the panhandle area was low and the potential to develop gravel resources was moderate to high. However, developing this resource currently would not be economically feasible because gravel is a low unit value/high volume commodity, sensitive to market location because of transportation costs. Small lots of gravel from this area are and will continue to be extracted and used by county and state highway maintenance crews.

3.10.8 Patented and Unpatented Mining Claims

The lands proposed for withdrawal are all federal public lands administered by the BLM. In 1982, the Navy submitted an application to withdraw 181,323 acres of these lands around training ranges B-16, B-17, and B-19. This application closed the originally proposed withdrawal land to mineral location for a maximum of two years, as specified in FLPMA. Public Law 98-473 continued the segregation indefinitely. Under FLPMA, claims made on these lands after September 20, 1982, such as the Cinnabar Hills mine area and Jet Claims group, would be considered null and void. An additional 7,750 acres were later added to the proposed land withdrawal area, and an application to withdraw these lands was submitted in 1992. The 7,750 acres is a part of the area formally closed by BLM on February 1, 1991, because of ordnance contamination. Claims made on the additional land after September 8, 1992, may be considered null and void (Loo 1995). These lands currently are closed to the public due to off-range ordnance.

3.10.8.1 Mining Laws

A variety of federal and state laws regulate mining activities in Nevada. These laws dictate how claims are to be located, registered, and maintained. The major federal law governing mining activities on the withdrawn lands is the Mining Law of 1872, as amended (30 U.S.C. 22-54). This law allows individuals and corporations to use and appropriate public lands and their mineral resources for mining exploration and production. The law also includes provisions for enacting state mining laws that are consistent with federal law.

Nevada state law describes the procedure for locating a claim, marking claim boundaries, and filing the claim with certain agencies. FLPMA requires claimants to file a copy of the official record of the notice or certificate of location with the BLM state office, including any amendments to claim boundaries or changes in ownership.

3.10.8.2 Mining Claim Process

Unpatented Claims

Anyone who is a citizen of the United States or has declared an intention to become a citizen may locate a mining claim. The right to possess minerals is obtained by staking a claim on open or unreserved federal lands. Generally, staking a claim involves marking the claim boundaries with corner posts or monuments, posting a notice of location in a conspicuous place, and providing the location to the proper authorities, including the BLM state office and appropriate county or state agencies.

In Nevada, the process of locating an unpatented mining claim is as follows: on open or unreserved land, stake a claim by placing a location monument marking where the mineral was found and put a notice of discovery on the monument; within 60 days put up corner posts defining the boundaries of the claim; within 90 days file a certificate of location and a map of the claim site with the BLM state office and the county and pay an application fee.

To maintain an unpatented mining claim in Nevada, the claimant must fulfill certain annual requirements. Prior to 1993, claimants in Nevada had to file an affidavit by December 30 of each year to prove they had performed over $100 in improvements to their claim over the previous year or they lost the claim. The BLM Appropriations Act of 1994 (fiscal year) required mining claimants with 10 or more unpatented claims to submit a $100 per claim rental fee by August 31, 1993, to the BLM state office or they forfeited their claim. A similar requirement existed under the BLM Appropriations Act of 1995, except the fee was called a maintenance fee.

Claimants with fewer than 10 claims may file for a small miner certification by the August 31 deadline to avoid paying the rental or maintenance fee. A claimant choosing to do this still has to file an affidavit proving the expenditure of $100 or more to develop the claim.

Valid and Patented Claims

A discovery is defined as a mineral in place having sufficient value to pass the "prudent man rule"; that is, a person of ordinary prudence would be justified in the further expenditure of labor and means, with a reasonable prospect of success (BLM 1991b). Once a discovery is made, a claim is considered valid and can be patented under the 1872 mining law. Valid mining claims are considered private property. Additional requirements to obtain a mineral patent include the following:

- Having the claim surveyed by a mineral surveyor;
- Posting a "notice of intent to patent" on the claim or site and publish the notice in a local newspaper for a 60-day period;
- Paying the BLM a nonrefundable application fee of $250 plus an additional $50 for each additional claim/site in the application;
- Showing the BLM evidence of right of title to the claim or site;
- Showing the BLM proof of mineral discovery of a valuable mineral deposit; and
- Showing the BLM that not less than $500 worth of development work or improvements have been made to each claim (BLM 1991b).

A federal mineral examiner evaluates the patent application and claim. If all the above requirements have been met, the claimant may purchase the claim or site at a cost of from $2.50 to $5 per acre (BLM 1991b). A mineral patent gives the holder clear and absolute title to the land, making it private property. Claimants with patented claims do not have annual reporting or fee requirements.

3.10.8.3 Mining Claim Inventory

The 1987 Mineral Resource Inventory Report found that in October 1986, the area of the proposed land withdrawal contained 38 patented mining claims either partially or totally within the project area. A 1997 BLM record search revealed no additional patented claims to those 38 identified in the prior report. There are 11 claims near B-17 on Category A land; the remaining 27 claims are located on Category B land in the Dixie Valley area.

A BLM record search showed that there are 16 active unpatented claims for which maintenance fees were received by BLM in 1997. All 16 of these claims exist on Category B lands in the Dixie Valley area. There are 19 claims near B-16 for which small miner certification status was filed in 1996. Seventeen of these 19 claims exist on Category B lands; the remaining two are on Category A lands.

There are an additional 50 claims around B-17 that are technically active but for which neither maintenance fees nor small miner certification requests have been submitted. Fifteen people requested a deferment in 1997 and three requested a deferment in 1996. If a miner can establish that he or she is unable to work a claim but would like to keep the claim active, he or she may request that the maintenance fee be deferred. All 18 of the claims filing deferrals exist on Category A lands.

The Navy contested the validity of the remaining claims, and hearings to decide their status were held. The BLM and a registered geologist performed the necessary field and lab work and prepared mineral studies. In that undertaking, they were unable to substantiate a marketable discovery of minerals. The claims were contested before the Department of Interior Bureau of Land Appeals; however, the Payne and Baughman claims were declared null and void.

A listing of all patented and unpatented claims is contained in Appendix H. Figure H-1 shows the general locations of the patented and unpatented mining claims.

3.11 LIVESTOCK AND WILD HORSE MANAGEMENT

This section addresses those wildlife and livestock management areas that are officially designated for management by a federal agency. These areas include livestock grazing allotments and wild horse herd management areas.

3.11.1 Livestock

The BLM manages livestock grazing within the proposed withdrawal land footprints. The BLM manages grazing under the authority of the Taylor Grazing Act of 1934, the Federal Land Policy Management Act of 1976, and the Public Rangelands Improvement Act of 1978. Under this management, ranchers may obtain permits for an allotment of public land on which a specified number of livestock may graze. The number of permitted livestock on a particular allotment is determined by how many animal unit months (AUMs) that land will produce. The BLM operates a program to stabilize or improve the ecological condition of the allotments. This program includes proper management of livestock grazing and such improvements as fences and water developments.

Within the Lahontan Resource Area of BLM's Carson City District, there are 30 grazing allotments ranging from approximately 7,600 acres to 305,000 acres and totaling 80,000 AUMs of grazing preference (BLM1985a). Of these allotments, nine partially overlap the potential withdrawal lands (Table 3-10 and Figure 3-10). These allotments contain 39,527 AUMs of grazing preference and 1,219,483 acres of public land. The potential withdrawal area contains approximately 5,386 AUMs of grazing preference. In addition, BUREC administers grazing north of B-16.

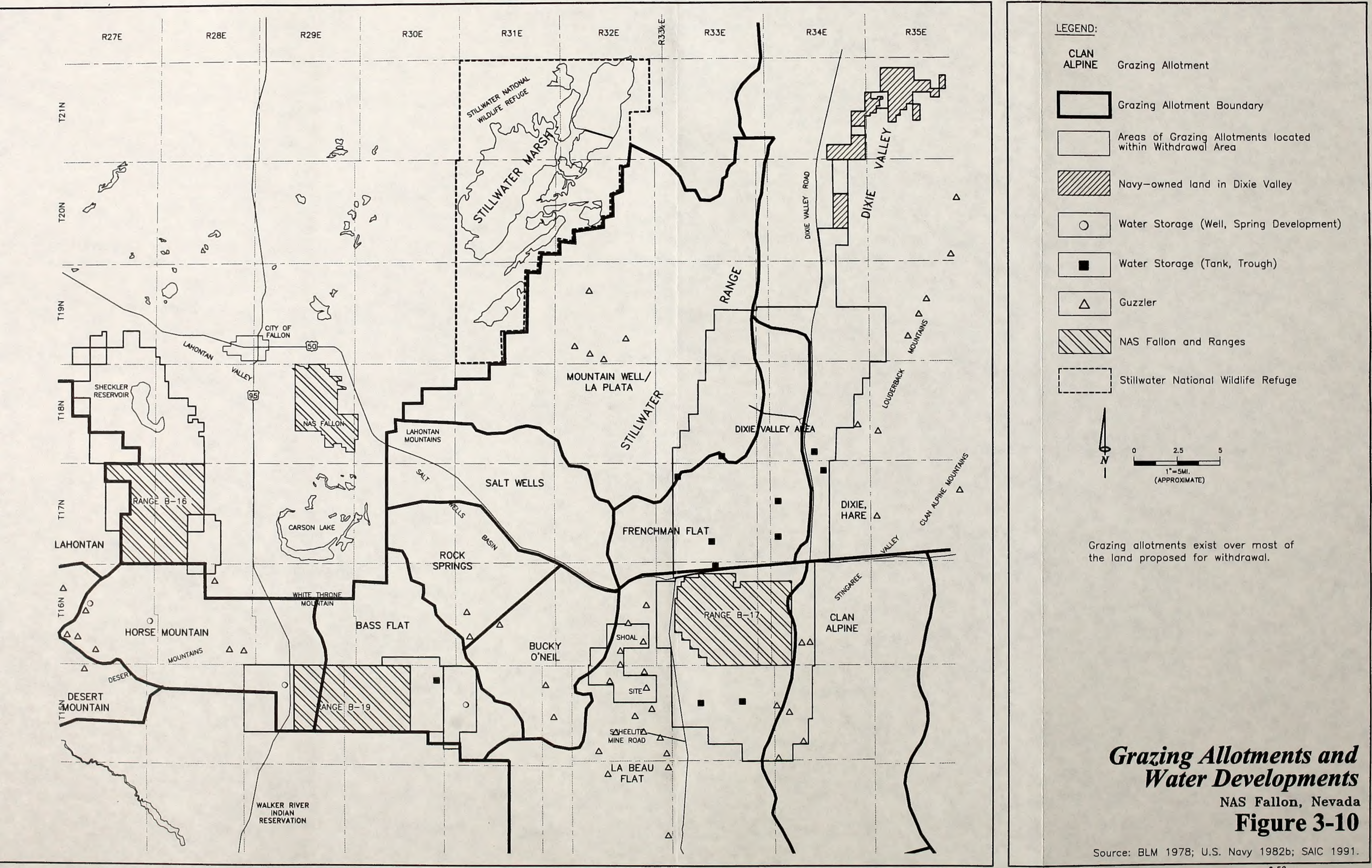
TABLE 3-10
GRAZING ALLOTMENT DATA FOR ALLOTMENTS PARTIALLY WITHIN MAXIMUM WITHDRAWAL AREA

Allotment	Grazing Preference (AUMs)	Total Acreage	Approximate Acres of Grazing Allotment within Maximum Withdrawal Area	Approximate AUMs within Maximum Withdrawal Area
Bass Flat	1,587	41,255	12,160	468
Clan Alpine[1]	11,410	388,646	11,200	328
Bucky O'Neill	1,500	39,054	960	37
Dixie Valley	6,495	273,841	45,280	1,073
Frenchman Flat	1,750	67,126	43,120	1,123
Horse Mountain	3,000	63,043	10,960	521
La Beau Flat	3,930	155,923	31,040	782
Lahontan	1,155	52,910	6,560	143
Mtn. Well/La Plata	8,700	137,685	14,400	911
TOTAL	39,527	1,219,483	175,680	5,386

Source: Minor 1995

[1] Clan Alpine is composed of two allotments, one of which contains a portion of the potential withdrawal.

In 1991, after the Navy performed off-range ordnance sweeps around the FRTC training ranges, the BLM requested that the Navy post signs or fence the lands containing off-range ordnance. Some of these lands fall within existing grazing allotments. Once the lands are withdrawn, Category A lands will be excluded from further grazing.



Grazing allotments exist over most of the land proposed for withdrawal.

Grazing Allotments and Water Developments

NAS Fallon, Nevada

Figure 3-10

Source: BLM 1978; U.S. Navy 1982b; SAIC 1991.

3.11.2 Wild Horses

The three herd management areas (HMAs) within or adjacent to the potential withdrawal area are Horse Mountain, Clan Alpine, and South Stillwater. Figure 3-11 illustrates the locations of the HMAs. Under the Wild Horses and Burros Protection Act of 1972 (PL 92-195), the Secretary of the Interior is required to protect and preserve wild free-roaming horses and burros by managing land administered by the BLM. The BLM Carson City District is responsible for managing wild horse populations within the potential withdrawal areas.

The Lahontan Rangeland Program Summary of 1985 (BLM 1985c) set management objectives for each of the wild horse herd management areas. The management objectives include the maintenance and enhancement of habitat to provide forage for a specified number of horses. The summary also calls for a periodic census to be taken of the wild horse population and for additional monitoring to determine areas of use, seasonal movement patterns, sex ratios, and other facets of population dynamics so it may be determined if management objectives are being met. The plan for each of the HMAs calls for maintaining the wild horses in good or excellent physical condition; maintaining the free-roaming nature of the wild horses; maintaining the wild horses within the HMA; and minimizing adverse effects of gathers to both the individual wild horses and to the population. The Clan Alpine HMA Plan calls for providing an area to place unadoptable horses removed from HMAs; removing only adoptable animals; maintaining genetic diversity; and minimizing stress to released animals. The South Stillwater HMA Plan calls for removing only adoptable animals and maintaining genetic diversity.

The Horse Mountain HMA is approximately 1.5 miles south of B-16, within the Horse Mountain, Desert Mountain, and Cleaver Peak grazing allotments. The HMA covers 52,422 acres of public and private land and can support a maximum of 95 horses (BLM 1991c). Based on consultation with the BLM (Gianola 1996) and a survey of the area by a NAS Fallon biologist (Rathbun 1996b), the heaviest use of the HMA is near the TCID canal, east of B-16 near Highway 95.

The Clan Alpine HMA is at the northeast corner of the proposed Dixie Valley area withdrawal and within the Clan Alpine, Cow Canyon, and Dixie Valley grazing allotments. The HMA covers 314,986 acres of public and private land and can support a maximum of 979 horses (US Navy 1992).

The South Stillwater HMA is at the northwest corner of the proposed Dixie Valley area withdrawal and within the Mountain Well/La Plata grazing allotment. The HMA covers 9,940 acres of public and private land and can support a maximum of 16 horses (US Navy 1995).

The current horse populations for the HMAs are approximately 70 for Horse Mountain, over 1,000 for Clan Alpine, and 15 to 20 for South Stillwater.

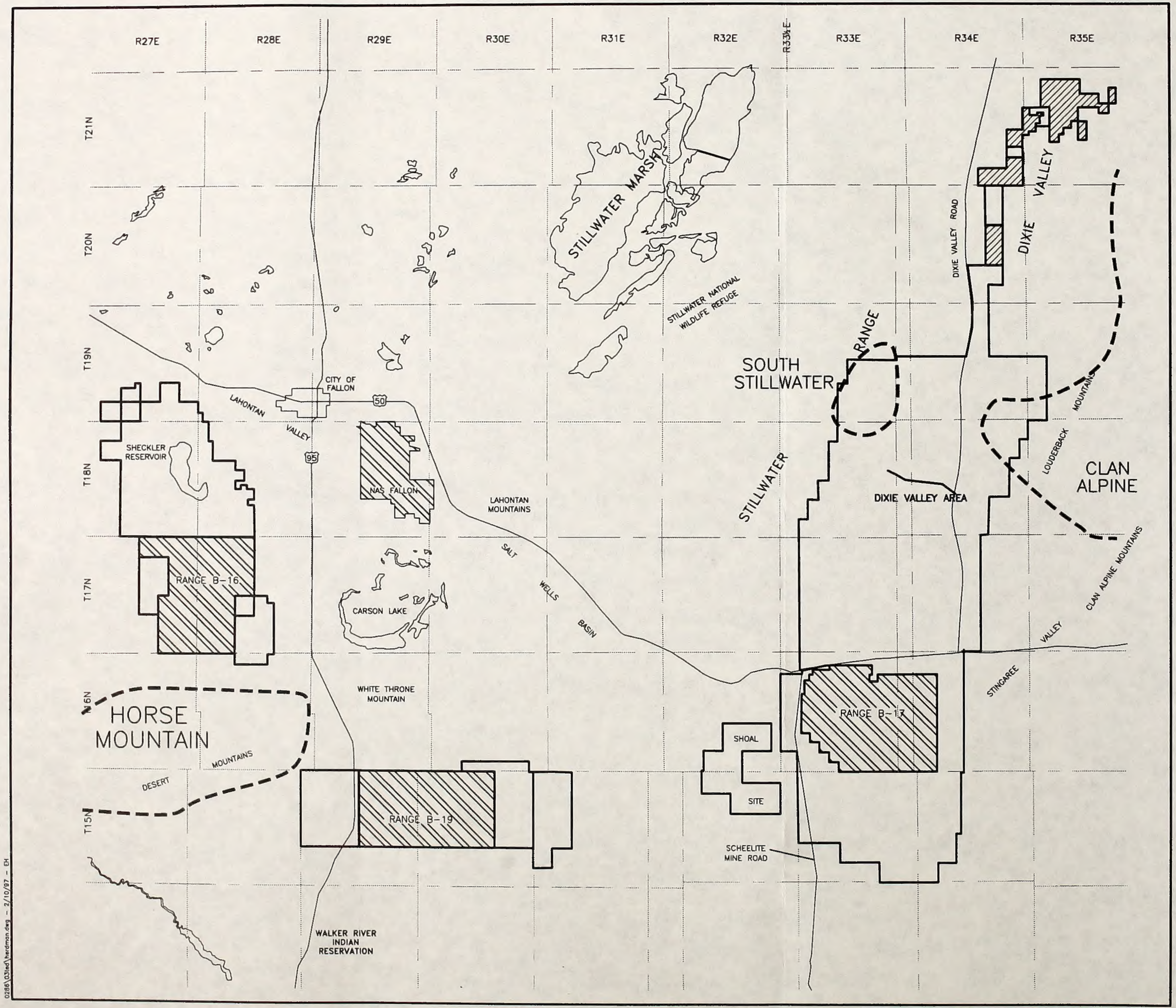
3.12 RECREATION AND PUBLIC ACCESS

This section describes the recreational activities in the study area and the management of those activities. Although recreation occurs throughout the proposed withdrawal lands, most activities take place during wet years at locations such as Sheckler Reservoir. These areas are illustrated in Figure 3-12.

Common recreational activities in the study area include hunting and trapping of fur-bearing animals, camping, hiking, horseback riding, fishing, bird watching, and off-road vehicle (ORV) use (Knight 1995). Additional activities, although more limited, include motorcross, snow sports, boating, swimming, pine nut gathering, wood-cutting, visiting mines and ghost towns, and rock, fossil, flora, and insect collecting.

Areas that are used by recreationists and that are within or partially within the proposed withdrawal area include the Sheckler Reservoir (used during wet periods), Stillwater Range (including the Job Peak Wilderness Study Area), Sand Springs Range, Salt Cave, and the Fairview and Wonder mining districts. Of these sites, the Sheckler Reservoir and Stillwater Range have the highest levels of recreational activity The Stillwater Range, including the LaPlata and Elevenmile drainages, offers high quality, undeveloped, semiprimitive and primitive recreation opportunities. The Stillwater Range north of Elevenmile canyon has been identified through the BLM wilderness inventory process as having outstanding wilderness qualities.

The southern Clan Alpine Range and La Plata District are adjacent to the proposed withdrawal, with access through the withdrawal. The shoal site and Sheckler Reservoir are popular hunting and camping areas. Organized ORV events are held twice each year in areas to the west and east of B-19. Organized ORV events also occur near B-16 and B-17. The Pony Express National Historic Trail is parallel to Highway 50 through the proposed withdrawal areas and is visited by recreationists. An annual re-ride of the trail takes place in June. The trail is also part of the American Discovery Trail, a coast-to-coast hiking trail.



LEGEND:

CLAN ALPINE Herd Management Areas
▭ Herd Management Area Boundary
▨ Navy–owned land in Dixie Valley
▨ NAS Fallon and Ranges
N
0 2.5 5
1"=5MI. (APPROXIMATE)

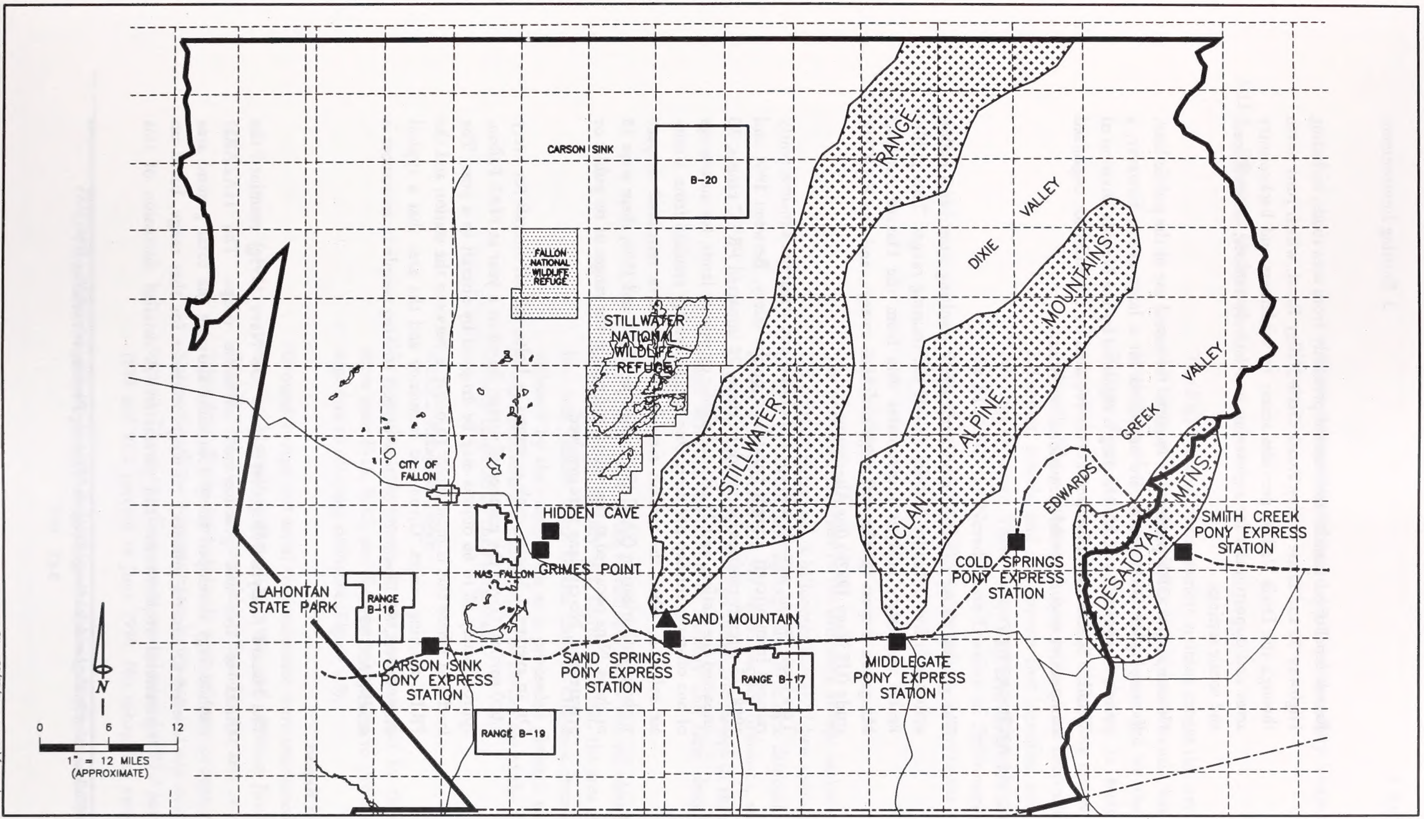
The Wild Horses and Burros Protection Act of 1972 requires the Secretary of the Interior to protect and preserve wild and free–roaming horses and burros through management of land administered by the BLM.

Herd Management Areas

NAS Fallon, Nevada

Figure 3-11

Source: BLM 1978; U.S. Navy 1982b; SAIC 1991.


CARSON SINK
B-20
FALLON NATIONAL WILDLIFE REFUGE
STILLWATER NATIONAL WILDLIFE REFUGE
RANGE
DIXIE
VALLEY
MOUNTAINS
ALPINE
CLAN
STILLWATER
GREEK
VALLEY
EDWARDS
MTNS.
DESATOYA
SMITH CREEK PONY EXPRESS STATION
COLD SPRINGS PONY EXPRESS STATION
CITY OF FALLON
HIDDEN CAVE
GRIMES POINT
NAS FALLON
LAHONTAN STATE PARK
RANGE B-16
SAND MOUNTAIN
CARSON SINK PONY EXPRESS STATION
SAND SPRINGS PONY EXPRESS STATION
RANGE B-17
MIDDLEGATE PONY EXPRESS STATION
RANGE B-19
N
0
6
12
1" = 12 MILES (APPROXIMATE)

Expansive land areas contribute to the wide variety of recreational opportunities in the area.

LEGEND:

- ▩ Mountain Ranges used for outdoor recreation
- ░ State Park/Wildlife Refuge
- ------- Pony Express National Historic Trail/ American Discovery Trail
- ■ Historic Sites
- ▲ ORV use area

Source: Churchill County Master Plan 1990; BLM 1978

Important Recreational Resources in the Study Area

NAS Fallon, Nevada

Figure 3-12

Recreational opportunities are accessed primarily from area roads, including Highway 50 and Dixie Valley Road. Dixie Valley Road, which runs north through the Dixie Valley, provides access to wilderness and backcountry areas and opportunities for sightseeing in relatively remote, undeveloped, and scenic settings.

No camping or ORV permits are required for casual use of the public land. If camping or ORV groups are organized for a large event, however, a permit is required by BLM. Hunting is regulated by the Nevada Division of Wildlife. Special recreation permits are required by the BLM for organized competitive or commercial recreational activities.

3.13 PUBLIC HEALTH AND SAFETY

The greatest threat to public health and safety resulting from NAS Fallon activities is live ordnance landing outside the training ranges. This public health and safety analysis incorporates data from the Hazard Analysis Mitigation Report (1995g), off-range ordnance sweeps, and the RAICUZ study (US Navy 1982b) (for Alternative I).

To a lesser extent, aircraft mishaps and objects and armaments inadvertently released from aircraft present hazards to public safety. Between 1964 and 1988, 75 aircraft mishaps occurred; of these, 20 impacted FRTC ranges, 30 impacted the station, and 25 affected public or private lands, for an average of one off-range mishap per year. One civilian fatality resulted from a mid-air collision, when the civilian aircraft entered active restricted airspace without authorization (SAIC 1991). Between 1989 and 1996, there were 18 mishaps. Nine occurred at the station and nine at the ranges or on public or private land. No civilians were involved.

On an average, 1.5 parts, such as screws or bolts, fall off aircraft for every 1,000 sorties. Given the number of sorties flown in a year at NAS Fallon, approximately 60 to 66 objects may be dropped by aircraft in a year. The land area where this is most likely to occur is between the station and the FRTC training ranges. Given this frequency and the area that a typical sortie covers, the likelihood of these objects striking people or structures is small (SAIC 1991).

3.13.1 Hazard Analysis Report

The Hazard Analysis Mitigation Report (US Navy 1995g) examined the effects of live and practice/inert ordnance drops. The HAZARD methodology developed safety footprints showing the total ground area needed to contain potential off-range ordnance for that range, based on operational requirements and parameters. A detailed discussion of this report is located in Section 1.4.3.1 and the safety footprints are mapped in Figure 1-3.

3.13.2 Off-range Ordnance

The FRTC includes four remote training ranges that are used in support of the Navy mission. Military ordnance inadvertently has fallen outside the boundaries of these ranges onto land managed by the BLM and on the Walker River Indian Reservation. Beginning in early 1989, the Navy organized sweeps of areas adjacent to the training ranges to locate off-range ordnance. The perimeters of these sweeps were determined on the basis of helicopter, vehicle, and foot surveys that identified areas likely to contain off-range ordnance. These sweeps and reconnaissances are coordinated with the BLM and the Nevada State Division of Environmental Protection, as outlined in a March 1995 memorandum of agreement regarding off-range military ordnance.

3.13.2.1 Sweep Methodology

The personnel involved in the ordnance sweeps included a sweep team of 115 military personnel, a helicopter survey/debris removal team, consisting of eight personnel, and an explosive ordnance disposal (EOD) team. The survey area covered 226,592 acres. Surface ordnance, suspected ordnance, and scrap were located through systematic sweeps of the survey area. EOD teams followed the sweep to identify and later detonate any ordnance located.

The effectiveness of the search operations was calculated through a sweep effectiveness probability test. During this test, the area ahead of the sweep line was "salted" with several control ordnance items. The items were collected by the sweep team as it proceeded through the salted area. The sweep effectiveness is expressed as the percentage of the known salted items actually collected by the sweep team.

3.13.2.2 Results of Sweep

As a result of the sweeps, it was recommended by the BLM that 24,464 acres near B-16, B-17, and B-19 be withdrawn to protect the public from exposure to off-range ordnance (Figure 1-5).

Ground sweeps and aerial reconnaissance were conducted off-range of B-16 between November 27 and 30, 1989, and between June 11 and 15, 1990 (Figure 3-13). Data on the ordnance found in the area swept are provided in Table 3-11. Flares were the only type of new ordnance found off-range. Korean Conflict-era targets (three bull's-eyes and one strafe target) also were located. The sweep effectiveness was calculated at 91.7 percent in November 1989 and 97.0 percent in June 1990. No subsurface sweep was conducted because effective subsurface sweep technology or methodology for large areas did not exist.

Ground sweeps and aerial reconnaissance were conducted off-range of B-17 during June and November of 1989 and from June 18 to 28, 1990 (Figure 3-13). Data on the ordnance found in the area swept are provided in Table 3-11. New off-range ordnance consisted primarily of flares and a few practice bombs. The surface sweep effectiveness was calculated at 92.7 percent in November 1989 and 95.0 percent in June 1990. No subsurface sweep was conducted because, as previously noted, effective subsurface sweep technology or methodology for large areas did not exist.

TABLE 3-11
RESULTS OF OFF-RANGE ORDNANCE SWEEPS

Range	Date	Ordnance Items			SEP[1]	Related
		Live	Practice	Total	(%)	Scrap (lbs)
B-16	November 1989	0	103	103	91.7	3,500
B-16	June 1990		708[2]	726	97.0	24,700
B-17	June 1989	551	0	551	N/A	N/A
B-17	November 1989	793	1,905	2,698	92.7	80,800
B-17	June 1990	779	523	1,302	95.0	20,820
B-19	March 1989	1,570,358	532	1,570,890	N/A	128,000
B-19	December 1989	12,258	16,381	28,639	92.7	36,575
B-19	June 1990	707	6,666	7,373	91.5	16,410
TOTAL		1,585,575	26,707	1,612,283		310,805

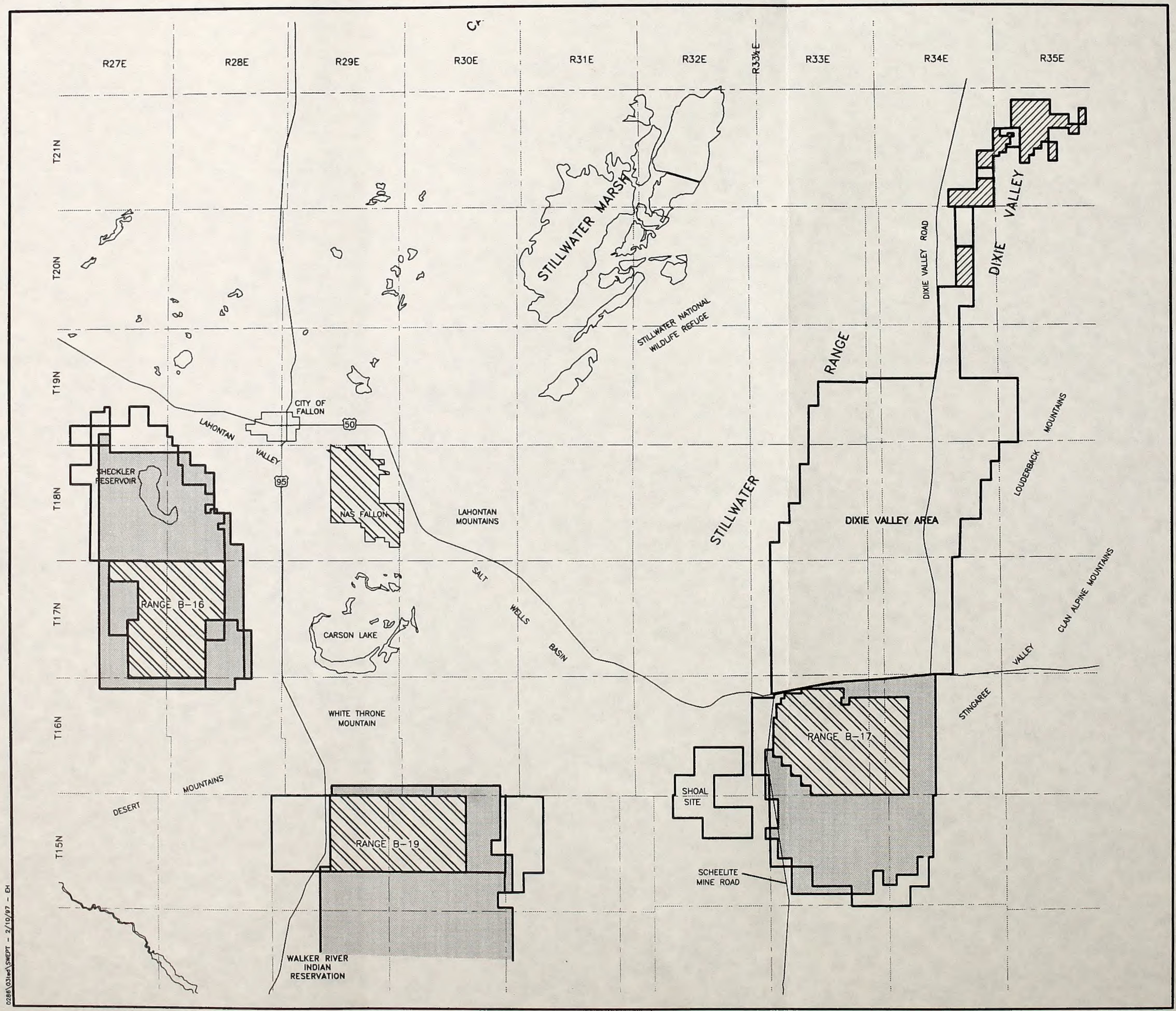
Note: 1,608,772 of the 1,612,283 total ordnance items (99.782 percent) were 20mm-40mm strafe/ammunition scrap, with 99.781 percent located off Bravo-19

[1] Sweep effectiveness probability

[2] Of the total number of items found, 129 may have had some small explosive components. The 129 items consisted of:

80 – Strafe/ammo pre-1968 rounds
9 – Unspent flares
1 – MK 4 cad – small explosive to push bomb off rack
37 – 4 lb. practice bombs – pre-1968 – age did not allow determination of status of spotting charge
1 – 2.25 inch pre-1968 rocket
1 – 2.75 inch rocket motor

Ground sweeps and aerial reconnaissance were conducted off-range of B-19 during March and December l989 and June 1990 (Figure 3-13). Information on the ordnance found in the area swept is reported in Table 3-9. The vast majority of off-range ordnance was strafe gun ammunition scrap. The surface sweep effectiveness was calculated at 92.7 percent. No subsurface sweep was conducted. Aerial photos of B-19 showed that the strafing target, which is 3,000 feet north of the south fence line, was not in an east/west configuration. Targets were realigned in October 1990, drastically reducing off-range strafe gun scrap. The off-range ordnance south of B-19 is on the



LEGEND:

▨ Areas Swept for Ordnance

▨ Navy–owned Land in Dixie Valley

▨ NAS Fallon and Ranges

N

0 2.5 5
1"=5MI.
(APPROXIMATE)

Ordnance sweeps covered 226,592 acres.

Areas Swept for Off-Range Ordnance in 1989 and 1990

NAS Fallon, Nevada

Figure 3-13

Source: U.S. Navy 1990a

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Walker River Indian Reservation. The Navy will continue to consult with the Walker River Paiute Tribe to determine how off-range ordnance in this area is to be managed in the future.

The BLM requested that the Navy provide an analysis/feasibility report concerning what subsurface sweep technology currently exists, what would be required to completely sanitize the lands, and the specific location, type, and scope of subsurface contamination. In April 1990, the Department of the Navy provided the BLM with information concerning subsurface ordnance detection. The information stated that the only method available for subsurface detection was a hand-held magnetometer that searches a width of approximately one meter. This device is designed to locate large ferrous objects in a centralized area and is not suited for large-scale sweep operations. The Army procured a Stoles sub-surface search system to be used in base closures that is capable of searching 20 acres of flat terrain per day, to an average depth of 10 feet, with approximately 60 percent reliability. The Naval Research Laboratory has developed an ordnance remediation technology, the Multi-sensor Towed Array Detection System (MTADS), with an estimated efficiency of 96 percent. MTADS uses magnetometers and pulsed sensors mounted on platforms that are towed by all-terrain vehicles. The technology locates, identifies, and categorizes military ordnance at its probable maximum self-burial depth. MTADS was tested at the Badlands Bombing Range in South Dakota and demonstrated at test ranges around the country. NAS Fallon is working with the Walker River Paiute Tribe to investigate the potential use of the technology on off-range ordnance lands at NAS Fallon.

Regardless of the detection method, once any ordnance is located, it must be unearthed and rendered safe or detonated from the surface. The Navy believes that because of the limitations of available subsurface search technologies and the erosion and type of terrain at the FRTC subsurface, cleanup of contaminated off-range areas cannot sufficiently restore these areas for public use in the foreseeable future.

3.13.2.3 Changes in Operations

In response to discoveries of off-range ordnance, NAS Fallon operations have been changed to reduce the occurrence of off-range ordnance. In addition to realigning the strafing target at B-19, planes dropping live ordnance are accompanied by airborne, nonparticipating observation aircraft. If these aircraft see a plane drop ordnance outside the range, the pilots are to notify the NSAWC Range Department, which would have EOD personnel dispose of the ordnance. In addition, NAS Fallon has modified its operating rules for ordnance delivery and has expanded aircrew briefings to minimize the risk of ordnance being dropped off-range. In addition, a memorandum of agreement concerning off-range military ordnance was developed among the Navy, the BLM, and the state of Nevada in December 1989 and updated in 1995. The purpose of the memorandum is to minimize the risk to public safety, to maximize the speed and efficiency of any future retrieval operations, and to establish a framework for mutual assistance and consultation in the future on lands adjacent to Navy training ranges within Nevada. The major sections of the memorandum include a description of a regular ordnance reconnaissance program and an emergency retrieval program. While these changes have reduced the occurrence of off-range ordnance, the potential for some safety concerns still exists in some areas (Figure 1-3).

3.13.3 RAICUZ Study

The NAS Fallon RAICUZ study identified areas contiguous to the FRTC training ranges where safety or noise considerations were found to exceed Navy guidelines for various land uses. Maps showing noise, safety, and incompatible use zones for each range were presented in the RAICUZ document and were updated for current and future aircraft types and aircraft operations in the Draft EIS for the supersonic operations (US Navy 1986). The RAICUZ safety and noise zones are mapped on Figure 1-6 in Chapter 1. The RAICUZ study, along with the off-range ordnance sweeps, was the basis for defining the land withdrawal boundaries designated for Alternative I.

To improve safety in the Fallon Special Use Airspace (SUA), a MOU among the Department of the Navy, the Department of the Interior, and the state of Nevada was completed in July 1987. The document outlined coordination procedures that were designed to facilitate scheduling air operations so that each agency involved could perform its objectives in compliance with maximum safety standards.

3.14 TRANSPORTATION

The Lahontan Valley is served by two primary highways, US Route 50 and Route 95. Route 50 is an east-west highway that passes through central Churchill County and links Fallon to Ely in the east and to the Reno-Sparks area to the west. Route 95 runs north-south through Fallon, linking it to Interstate 80 to the north and the town of Hawthorne to the south. State Route 361 serves the Gabbs Valley area and links the valley to both Route 50 and Route 95. State Route 839 (Scheelite Mine Road) links Route 50 with Hawthorne and provides access to the Fairview Valley. The Dixie Valley area is served by State Route 121, the Dixie Valley Road. Bell Canyon Road, which runs through the southern Fairview Mountains, and other local roads and trails also serve the region. Local roads primarily serve mining areas and also are used for dispersed recreation and by BLM grazing permit holders.

The existing land withdrawals do not affect any major highways in the region; however, public use of some local roads that pass through lands controlled by NAS Fallon and the FRTC is not permitted. There is a gas line service road east of B-19 in an area closed because of off-range ordnance. The Navy has swept and cleared the road and maintains annual sweeps to continue to allow public access. The road would remain open for public access under the proposed land withdrawal. This is possible because soil-to-bedrock conditions are shallow, which doesn't permit ordnance to be buried under the surface. Off-range ordnance would remain on the surface and would be easily identified and collected by the explosive ordnance disposal team. In addition, training operations at B-19 have been altered to greatly reduce the potential for off-range ordnance to fall in this corridor.

3.15 AIRSPACE DESIGNATION AND USE

A discussion of all current military airspace designations associated with NAS Fallon and their use is provided in Chapter 5 as part of the cumulative effects analysis. Figure 5-2 depicts the existing NAS Fallon airspace.

Present Navy flight operations in the region include combinations of high-altitude training and low-altitude ordnance delivery practice. The latter is limited to the restricted areas above the training ranges. High-altitude training within the MOAs presently includes the following types of missions:

- Inflight rendezvous during training missions;
- Air-to-air combat maneuvering;
- En route transiting to training ranges; and
- Supersonic flight activity.

Navy aircraft are operated at high speeds and may abruptly change altitude, speed, and direction. The average number of operations per active day at the NAS Fallon ranges is approximately 368 operations (or 184 sorties) per day, with intermittent peaks of 480 operations (or 240 sorties) per day during a busy month. These include the Navy, Air Force, and Marine Corps operations.

Civilian aircraft are restricted from flying through restricted areas unless cleared by the using agency; however, NAS Fallon has a letter of agreement with the FAA that allows unrestricted access to restricted areas when the areas are not actively being used by military aircraft. Typically, restricted areas are used by military aircraft from 7:15 AM to 11:30 PM (local time), Monday through Friday, and for a somewhat shorter period on Saturdays. Therefore, use of this airspace by nonmilitary aircraft is very limited. Civilian aircraft are free to use MOAs when military activity is occurring; however, in practice civil aircraft are often routed out of the MOAs (SAIC 1991).

Civil aviation in central Nevada includes recreation and business applications by mining companies, ranchers, medical professionals, and others. Extensive commercial aviation service is provided by the 15 airlines serving the Reno airport, and Sky West Airlines provides scheduled commercial passenger service to and from Elko and Ely. There are also several charter and air-taxi services in the Reno-Fallon area that provide aircraft for private hire.

There is a municipal airport at Fallon, with about 63 aircraft based at the airport and approximately 17,000 annual operations (White 1991). Other airports in and near the project areas are at Gabbs, Oxbow, Silver Springs, Austin, Lovelock, Yerington, and Schurz.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION 4-1

4.2 ENVIRONMENTAL IMPACTS AND MITIGATION PROPOSALS 4-4

4.3 UNAVOIDABLE ADVERSE IMPACTS 4-41

4. ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences of each alternative and the mitigation measures designed to minimize these impacts. The potential impacts are assessed in proportion to their significance, based on significance criteria. Measures to mitigate or reduce the level of significance of each impact are provided. The impact analysis is based on current training needs and scenarios. If changes in military technology and tactics require different scenarios, the Navy will comply with all appropriate regulations and environmental documentation.

4.1 INTRODUCTION

4.1.1 Focus of Analysis

This chapter evaluates the effects of the action and no action alternatives on the existing environment described in Chapter 3. To be consistent with Chapter 3, this chapter has been organized by resource area to provide a means to compare the impacts of the different alternatives on the individual resources. Analyzed are integrated air and ground training activities and the development of up to five EW and TACTS sites and approximately 50 visual cueing device sites. Most of these sites will be located on withdrawn public lands in the Dixie and Fairview Valley areas and east of B-19, away from sensitive resources to avoid adverse impacts. Where a site may have an impact, mitigation measures will be implemented. Such measures are discussed in this chapter under each resource category.

All withdrawn lands are categorized under one of two land use categories, as described in Chapter 2. The Navy has developed a resource management plan in consultation with the BLM, BUREC, and DOE prior to withdrawal (Appendix J). This plan will provide formal land use policies for the withdrawn lands, which will be placed in one of two land use categories. These categories provide a proxy guide for how the withdrawn land would be managed. Therefore, this chapter evaluates the potential environmental impacts that may result from implementing each alternative based on the land use categories.

Alternative II is the preferred alternative because it satisfies training and public safety requirements while minimizing the amount of land required for withdrawal.

4.1.2 Impact Significance Criteria

For the most part, the alternatives considered would not involve land-altering actions. The land proposed for withdrawal will continue to underlie the same flight areas. The proposed withdrawal would not cause an increase in flight operations or increase the size of the impact areas. Off-range ordnance lands currently under an emergency closure order and lands having the potential to be contaminated with off-range ordnance will be withdrawn.

The direct effects of military activities on the withdrawn lands (see Section 2.3) will be associated with access, development, and land use controls. The Navy intends to implement procedures to ensure that public access and development on withdrawn lands may continue, while providing for public safety and ensuring the continuing viability of the Navy mission at NAS Fallon and the FRTC.

Impacts from implementing any of the alternatives could be considered significant if they result in the following:

- Cause substantial deterioration, damage, or loss of cultural or natural resources, including threatened or endangered species or critical habitat;
- Exclude the public from unique scenic, natural, or wilderness resources or national trails;
- Substantially reduce or eliminate public access to public lands, including recreational resources, mineral resources, water resources, and grazing lands;
- Substantially reduce the quality of recreation opportunities;
- Substantially degrade the current visual quality of the area;
- Substantially restrict right-of-way or mining activities on public lands; and
- Jeopardize public health and safety.

Section 4.2 presents the results of the impact analysis for each resource category discussed in Chapter 3 and provides mitigation measures to reduce any impacts. Potential direct impacts by resource category and alternative are summarized in Table 2-6.

4.1.3 Chaff Studies

NAS Fallon has used chaff over B-17 and in the Dixie Valley area for over 30 years and will continue to do so under the proposed withdrawal. As discussed in Section 2.3.1, military aircraft use chaff as a defensive mechanism to avoid detection by enemy radar. In response to public comments during the scoping process, the effects of chaff use are discussed under each of the resource categories below. A general discussion of chaff is presented here to detail the existing body of knowledge available on chaff and chaff use.

Chaff is composed of glass fibers (silica), aluminum, and stearic acid. The glass fibers, called dipoles, are coated with aluminum of 99 percent or greater purity to reflect radar and then with stearic acid to prevent the fibers from sticking together. Chaff dipoles vary in length from 0.38 inches to two inches. A bundle of chaff contains approximately 2.1 million dipoles and weighs approximately 1.5 ounces. The silica in chaff contains no resin. Silica exists in nature as quartz in its pure state and is the main constituent of sand, sandstone, and diatomaceous earth. Aluminum, one of the most abundant elements in the earth's crust, is found in mica, kaolin, and feldspar. In its pure form, it is nontoxic, highly resistant to corrosion, and insoluble except in extremely acidic conditions (CRC Handbook of Chemistry and Physics, 1992-1993, p. 4-3). Varying amounts of aluminum are found in soil, air, water, and plant and animal tissue, including food products. The aluminum in chaff oxidizes to AL_2O_3, a compound found in nature from which aluminum is mined. The period of time over which aluminum oxidizes depends on environmental conditions and the size and shape of the original aluminum. Stearic acid is an environmentally benign organic compound that biodegrades after several days' exposure to light and air (US Air Force 1996).

Many studies on the effects of chaff have been undertaken over the past 40 years. Most of the studies have taken place at universities and government laboratories. Some of the most often cited include 1977 studies on the effects of chaff on Chesapeake Bay marine organisms, performed by the University of Delaware and the University of Maryland (University of Delaware 1977; Systems Consultants 1977), and a 1972 study of the effects of chaff on cattle, performed by the Canadian Department of Agriculture (as referenced in SEA 1989 and Naval Research Laboratory 1995).

In 1989, the Air Force Strategic Air Command released a study entitled, "Identifying and Evaluating the Effects of Dispensing Chaff from Military Aircraft" (SEA 1989). This study was conducted to document the environmental effects of chaff and was intended to be incorporated by reference in NEPA analyses to avoid repetitive discussions of issues related to chaff. The study reviewed and analyzed over 100 existing documents on the impacts of chaff to humans, livestock, land, fish and wildlife, plants, and radio frequency interference.

The Army conducted a study in 1992, "Environmental and Health Effects Review for Obscurant Fibers/Filaments," to provide a technical basis to establish the health and environmental effects of fibers and to establish a basic resource for site-specific environmental assessments for training and test releases of fibers (US Army 1992a).

In 1995 the Naval Research Laboratory released a documented entitled, "Analysis of Electronic Warfare Digest, Volume 17 No. 4, April 1994, Exclusive Report: Chaff Potentially Harmful to the Environment, Studies Say" (Naval Research Laboratory 1995). This document was in response to an article published in the Electronic Warfare Digest, stating that studies show chaff is harmful to the environment. The Navy study compared the information contained in the Electronic Warfare Digest to the original sources of the information.

The Air Force, Headquarters Air Combat Command, completed a study in August 1997 that develops more comprehensive scientific data on the use of chaff in training and the associated environmental effects (US Air Force 1997). The information contained in this report addresses potential effects from chaff use on human health, safety, air quality, physical resources (soil and water), biological resources, land use and visual resources, and cultural resources. The general finding of the studies noted above, including the studies that reviewed and analyzed multiple sources of chaff data, is that chaff is not harmful to humans, livestock, fish and wildlife, or plants. The chaff information included in this EIS represents the available data on the effects of chaff use. The Navy is willing to participate in cooperative efforts with other branches of the military or state agencies to further answer concerns regarding the use of chaff, providing that such an effort would not duplicate valid existing studies. The General Accounting Office has been directed and is in the process of conducting a study on chaff.

4.2 ENVIRONMENTAL IMPACTS AND MITIGATION PROPOSALS

4.2.1 Geology and Soils

4.2.1.1 Alternative I

Impacts: Alternative I would result in few direct impacts on soils or geology. Navy integrated air and ground training activities would not result in significant impacts to soil conditions. All vehicle traffic from training activities would remain on existing roads and trails, although foot traffic could take place on undisturbed areas. Use of helicopters during integrated air and ground training would increase wind erosion of site specific topsoil when hovering or landing. However, given the dispersed nature of the activities, impacts are not expected to be significant.

Potential indirect impacts on soils could accompany Navy development of individual EW, TACTS, and visual cueing device sites on Category A and B lands in the Dixie and Fairview Valley areas and east of B-19. A maximum of 75 acres would be affected. New site construction could require clearing and grading some sites or importing fill materials, which could result in slumping or increased landslide potential. These sites would be selected to avoid areas susceptible to high erosion rates. Impacts to soils that could occur from developing these sites, though not significant, will be avoided or mitigated through natural resource management techniques and standard geotechnical engineering and design. No significant impacts are expected.

Impacts to soils could result when existing roads or utility corridors were not available at Navy developed sites. These impacts, which could include erosion, soil compaction, and increased run-off, would not be significant because of the small area that would be affected. Impacts to soils that could occur from developing these roads or corridors, though not significant, will be avoided or mitigated through natural resource management techniques and standard geotechnical engineering and design.

The continued use of chaff would not impact soil quality. While detailed data on the effects of chaff on land are lacking, the quantity of aluminum leached out of chaff would have to be much higher than could result from the training use of chaff to have any detectable effect on soil quality. Laboratory tests of chaff conducted by the Air Force using a modified toxic characteristics leaching procedure indicated little or no potential for adverse effects on soil (US Air Force 1997). No known or documented adverse effects on soils have occurred at military facilities dispensing chaff. Based on existing data, no impacts to soil resources are expected to result from the continued use of chaff or the use of flares on low-level training missions (SEA 1989; Bohman 1991; Naval Research Laboratory 1995).

Mitigation: No mitigation required.

4.2.1.2 Alternative II (Preferred Alternative)

Impacts: Potential impacts on the existing environment from Alternative II would be similar to those described for Alternative I, including development of military sites.

Mitigation: No mitigation required.

4.2.1.3 Alternative III

Impacts: Impacts to soils would be similar to those described for Alternative I.

Mitigation: No mitigation required.

4.2.1.4 No Action Alternative

Impacts: The No Action Alternative would not withdraw public land. Development of EW and TACTS sites would not take place and no integrated air and ground training would occur except on existing lands administered by NAS Fallon. Therefore, soils would not be impacted.

Mitigation: No mitigation required.

4.2.2 Water Resources

4.2.2.1 Alternative I

Impacts: As discussed in Chapter 3, important water resources in the withdrawal area include developed springs, existing wells, storage tanks for livestock grazing, and guzzlers for wildlife use. Alternative I would not adversely impact existing water developments on Category B lands. Alternative I also would not affect new water developments on Category B lands, though water development would not be allowed at Navy military sites, such as EW or TACTS sites, during the time of their use. This would not be a significant impact because military developments would be located to avoid conflicts with future water improvements.

Alternative I would affect water developments on Category A lands. As described in Chapter 2, no new water developments would be permitted on Category A lands. In addition, access to existing water developments would be closed. There are currently four water developments on Category A land—one water storage trough east of B-19, two water storage troughs south of B-17, and one guzzler east of B-17. Given that grazing would not be allowed on Category A lands, the loss of water storage developments associated with livestock grazing would not be significant. The loss of access to water righted developments in and of itself, however, cannot be mitigated. The Navy and BLM signed a cooperative agreement in 1994 to allow the BLM access to the wildlife guzzler east of B-17.

The continued use of chaff is not expected to affect water quality. No large bodies of open water exist in the areas of chaff release, and chaff deposition is not condensed enough to present a potential leaching hazard to ground water. An Army toxicity and fate study submerged aluminum-coated chaff in salt water and in solutions of fresh water of varying hardness (US Army 1992b). The salt water had the highest amount of aluminum at approximately 2 mg/L after 24 hours. The hard and very hard water remained at concentrations of 1 mg/L, and the soft and very soft water remained below detectable limits after 21 days. The chaff in this test remained on the surface in clumps and was difficult to sink until individual fibers were separated manually (US Army 1992b). Any chaff in a body of water would either be blown across the water surface by wind or could become submerged if wet. Chaff would be filtered out by screens and settling tanks prior to being introduced into a drinking water system and would not reach the consumer (SEA 1989; Naval Research Laboratory 1995).

In laboratory tests conducted by the US Air Force, the highest concentrations of aluminum occurred at pH 4 (170 ppm) and the lowest at pH 7 (0.3 ppm). The freshwater acute value for aluminum is 1.496 ppm, and the chronic value is reported as 0.742 ppm for a pH range of 6.9 to 8.2. The extracts from the pH 7 samples, which lie within the 6.9-8.2 range, were approximately one-sixth the freshwater acute value for aluminum. These extract values represent a very high chaff-to-water ratio (1:20) that could not occur in the environment. Therefore, aluminum toxicity due to chaff is not a concern in aquatic environments (US Air Force 1997).

The freshwater acute value for copper is 0.018 ppm. Although no copper was detected in the laboratory tests, which had a detection limit of 0.02 mg/l, it is possible that trace quantities of copper could occur in some lots and, if deposited on freshwater bodies, could leach out. The quantity of chaff that would have to be released over a given water body would have to be very large, however, to reach acute values (US Air Force 1997).

Neither chemical nor physical effects are expected to occur to drinking water sources exposed to chaff. The quantities of chemicals released are too small to be of concern, and filtering systems would remove any fibers (US Air Force 1997).

Impacts related to wildlife, including use of guzzlers, are discussed in Section 4.2.3. No impacts to water resources would occur from ground-based training activities.

Mitigation: The Navy will explore means to compensate holders of water rights on Category A lands, subject to congressional authorization and appropriation.

4.2.2.2 Alternative II (Preferred Alternative)

Impacts: Alternative II would have impacts to water resources similar to those discussed for Alternative I.

Mitigation: Mitigations will be the same as discussed for Alternative I.

4.2.2.3 Alternative III

Impacts: Alternative III would have impacts to water resources similar to those discussed for Alternative I.

Mitigation: Mitigations will be the same as discussed for Alternative I.

4.2.2.4 No Action Alternative

Impacts: The No Action Alternative would not withdraw public lands. There would be no impacts to water developments on off-range ordnance lands. The lands are closed under existing conditions and would continue to be handled through BLM and Navy administrative processes.

Mitigation: No mitigation required.

4.2.3 Biological Resources

This section discusses the biological effects anticipated for each alternative. One of the primary issues in evaluating effects on wildlife is noise. Before the discussion of each alternative, a review of the current understanding of noise impacts on wildlife is provided.

Many studies have been performed concerning the effects of noise on wildlife and domestic animals; several of these were summarized by Manci et al. (1987). This literature synthesis documented variation in response to noise between classes, genera, and species, in addition to variation among individuals of the same species. The primary focus of the review was on induced stress and its effects on reproduction, behavior, and physiological responses. The authors note that data gaps still exist in the overall understanding of the effects of noise on wildlife. Difficulties in analysis arise because the reaction of a species can be affected by the intensity, number, duration, frequency, time of day, and season of the auditory disturbances. Since noise (even loud and disturbing noise) is a natural part of the environment for wildlife, it is frequently difficult to isolate a stimulus and its effects. Also, not all noises are human-made, as evidenced by the problems encountered by Plotkin et al. (1992) in their sonic boom studies. Their automatic recording devices were frequently tripped by thunderstorms, which were later distinguished by wave form rather than decibel level.

For humans, the information carried by a sound wave may be more disturbing than the sound itself just as temporal difference can affect the "annoyance factor" (e.g., a lawnmower at 6 AM vs. 11 AM) (Harrison 1978). There is no method for determining how content affects wildlife other than by measuring responses such as heart rate or changes in behavior.

For years, most studies involving nonlaboratory animals focused on the effects of sonic booms (Ames 1978), while other studies involved increased background noise levels. The results of these studies may not provide useful information in the context of determining the effects of jet overflights. Manci et al. (1987) reviewed several studies concerning noise effects on wild rodents in the vicinity of airports. Mice exposed to noise were found to have significantly greater adrenal gland weights (an indication of stress) than a control group that was not exposed to noise. However, the experimental design of this study appears to limit its applicability for analysis of military overflights within the FRTC as it ignores the transitory nature of these operations. In addition, the airport mice were exposed to considerably louder noise than that recorded by Krausman et al. (1993b) for low-level flyovers by F-16s.

The advent of advanced radiotelemetry equipment now makes it possible to measure the degree and duration of response. Krausman et al. (1993a, b, and c) and Workman et al. (1992) measured the effects of jet overflights on ungulates (hoofed mammals) by monitoring heart rate. Workman et al. (1992) caution against equating elevated heart rate with distress, suffering, or stress. They note that insects, such as bees and flies, caused more distress than aircraft flyovers, based on heart rate.

Ungulates: In a study monitoring noise impacts to the biota of Nevada from NAS Fallon operations, Lamp (NDOW 1989) observed no reaction from 72 percent of mountain sheep exposed to aircraft disturbances and only minor reactions from 24 percent. Mule deer showed minor reactions or no reactions 98 percent of the time. These findings were based on observations of free-ranging wildlife during actual military overflights.

The Air Force commissioned a study to examine the physiological responses of pronghorn, bighorn sheep, and elk to a variety of visual and auditory stimuli at Hill Air Force Base in Utah (Workman et al. 1992). This study monitored heart rate and body temperature responses to human presence, vehicles, sonic booms, subsonic F-16 low-level flyovers, helicopters, and fixed-wing aircraft (Cessna 182).

Body temperature of pronghorns was not affected by the stimuli, but heart rate was altered to varying degrees depending on the stimulus. Persons walking or running past a pen containing pronghorn elicited less response than a person entering the pen for 10 seconds. A tank driving past while blowing its horn elicited a relatively high response, while passing trucks, motorcycles, and two consecutive sonic booms elicited responses that were of short duration. Decreased responses to subsequent sonic booms indicated rapid habituation to this disturbance. Low-level flyovers by a Cessna 182 resulted in elevated heart rates, with some animals displaying no habituation.

In these instances, the pronghorn associated the sound with the plane, as indicated by their looking toward the incoming flight. Heart rate response to subsonic F-16 flyovers was both minimal and of short duration.

Helicopter flyovers demonstrated that both auditory and visual stimuli caused pronghorns to bolt and seek an escape. There was no habituation documented. Pronghorns responded strongly to hovering and remained alarmed as long as the helicopter hovered. Flyovers that followed a hovering episode drew greater responses than first-time flyovers, but Workman et al. (1992) thought it likely that habituation would occur with subsequent flyovers.

The portions of the study involving bighorn sheep and elk yielded similar results. Bighorn sheep in a pen had a greater response to someone standing in the pen or running past it than to someone walking by the pen. Responses to aircraft were transient and of short duration. Elk also exhibited little heart rate response to subsonic flyovers.

Another study found that herd of pronghorn ran when an OH-58 helicopter approached at 150 feet altitude. Since overflights of the area where the study was conducted were rare, they concluded that there had been little opportunity for habituation (Luz and Smith 1976).

A third series of studies on the effect of noise on ungulates found that aircraft overflights did not have a detrimental influence on heart rate in mule deer and bighorn sheep. In the initial study, desert mule deer and bighorn sheep were exposed to simulated low-altitude jet aircraft noise. Heart rate, body temperature, and behavior were monitored and compared for periods before, during, and after simulated overflights. Heart rates increased during overflights, sometimes more than doubling, but returned to resting rates in two minutes or less. As the study progressed, all animals became habituated to the sounds and both the rate and degree of increase in heart rate decreased. At the end of the study, mean heart rate changes were within normal expectations for seasonal changes (Krausman et al. 1993a).

The same study organizers installed heart-rate monitors on bighorn sheep in a 320-hectare (791-acre) desert enclosure. Heart rates and behavior were monitored before, during, and after low-level overflights by F-16 aircraft. Again, heart rates returned to preexposure levels in less than two minutes and behavior alterations were not long-lasting. Although the sheep often ran during noise exposure, they typically resumed normal activities after traveling less than 10 meters (Krausman et al. 1993b and c).

These studies suggest that serious or lasting detrimental effects on ungulates from aircraft overflights are unlikely. This does not mean that aircraft overflights do not cause stress in ungulates, but it suggests that such contact is unpleasant rather than harmful.

Birds: Research conducted in Arizona on eight raptor species that were subjected to low-level jet aircraft passes and simulated sonic booms showed no adverse effects on reproductive performance (Ellis et al. 1991). These experiments were conducted with habituated birds, but proximity to test stimuli varied from directly overhead to nests far from frequent military activity. Raptor responses to disturbances varied, including birds sometimes showing alarm, minimal response, ignoring the test stimuli, and occasionally flying from perches or nests. Adverse responses were never associated with reproductive failure.

Another study in Colorado found no difference in the reproductive success of habituated and nonhabituated red-tailed hawks to low-level helicopter flights or other air traffic (Anderson et al. 1989). Hawks not previously exposed to disturbances showed stronger avoidance behavior than habituated birds. Additional studies reviewed reported similar findings (Manci et al. 1987).

Studies of game birds found no effects on productivity estimates and hatching success of bobwhite quail and wild turkeys (Manci et al. 1987). Conclusions concerning the effects of noise on sage grouse brooding or nesting activities from NAS Fallon operations could not be drawn (NDOW 1989). Chukar (an introduced game bird) behavior was affected by low-level overflights, but chukar populations did not appear to be impacted significantly.

The National Biological Service, North Carolina Cooperative Fish and Wildlife Research Unit, conducted a quantitative study between 1990 and 1992 to assess impacts from military flight operations at the Mid-Atlantic Electronic Warfare Center on wintering and breeding waterfowl at nearby Piney Island, North Carolina. Based on survey results and an analysis of 30 years' worth of duck use data, the report found no evidence that waterfowl abundance and species diversity is negatively affected by aircraft activity (US Marine Corps 1996). However, studies of snow geese and waterfowl at Carson Lake observed responses to 54 percent of aircraft disturbances (NDOW 1987). The study also projected that there is a high potential for noise impacts to waterfowl at Sheckler Reservoir from military flights. No evidence in support of this projection has been gathered.

Other vertebrates: In general, the effects of noise on small mammals, reptiles, and amphibians are little known and poorly understood (Manci et al. 1987), and the specific effects of aircraft overflights on reptiles and amphibians have never been studied (US Forest Service 1992). There is no indication that there have been impacts from past or current military activities at NAS Fallon.

4.2.3.1 *Alternative I*

Impacts: No significant adverse impacts to endangered or threatened species are expected from implementing this alternative. Any potential roosting, foraging, or nesting habitat would not be altered or otherwise adversely affected.

Habitat for two endangered or threatened species, the bald eagle and American peregrine falcon, is found in the area proposed for withdrawal. Both of these species are migratory and reside in the Lahontan Valley during winter and spring. For feeding, bald eagles generally roost in tall cottonwood trees near large bodies of water, such as Carson Lake and the Stillwater NWR. The area north of B-16 proposed for withdrawal includes Sheckler Reservoir, which provides habitat for this species. American peregrine falcons have been observed at Carson Lake and Stillwater NWR but are not documented at the Sheckler Reservoir. No endangered or threatened species habitat is known to exist on Category A land.

The NAS Fallon Integrated Natural Resource Management Plan is being updated to include an inventory of potential sensitive habitats within the withdrawn lands. Biologists and natural resource experts with NAS Fallon will review all site plans in an effort to avoid any sensitive habitats. If sensitive habitats cannot be avoided, the Navy will coordinate with the Fish and Wildlife Service and will conduct any required biological evaluations and threatened and endangered species site surveys prior to EW or TACTS site development.

Noise impacts to wildlife species will not be significant under this alternative because the flight patterns would not be changed and the frequency of missions would not increase in response to the land withdrawal. Noise effects, however, are species-specific and dependent on the aircraft being used. The studies discussed above showed that most wildlife species that have been studied adapt to noise levels from military operations. Therefore, it is assumed that animals inhabiting the withdrawal footprint are habituated to overflights.

Noise generated from integrated air and ground training operations, such as helicopter operations and firing of Smokey SAMs, may startle wildlife. These effects would be of limited duration and would have only temporary effects on wildlife. The ground component of integrated air and ground training could have a more adverse effect on wildlife than air activity. A study found that human activity on the ground usually elicits a greater response in wildlife than do overflights or sonic booms (US EPA 1980).

Development and maintenance of water storage tanks and troughs, continued access for the study of reintroduced bighorn sheep, and other BLM wildlife management programs could be affected by the closure of Category A lands.

There are four water developments on Category A lands—one water storage trough east of B-19, two water storage troughs south of B-17, and one guzzler east of B-17. The Navy and BLM have a cooperative agreement that allows BLM access to the wildlife guzzler, which would continue under the withdrawal. To the extent allowable under safety constraints, the Navy will grant BLM access to Category A lands to study reintroduced bighorn sheep. The Category B designation would not affect maintenance of water developments.

Impacts from military activities, including integrated air and ground training activities on foot and in vehicles and the placement of EW, TACTS and visual cueing device sites, would not be significant. Constructing the developed sites would result in vegetation loss and some wildlife displacement. Approximately 75 acres could be affected. The affected area could increase if roads and utility corridors do not already exist. This represents a small percentage of the total withdrawal area. Natural resources, including soils, flora, and fauna on EW, TACTS, and visual cueing device sites would be subject to identification, analysis, and impact mitigation, as required by various federal environmental laws and regulations. Ground training would take place in the Dixie Valley area and on a more limited basis south of B-17. Training is not expected to take place along Scheelite Mine Road or where tarantulas migrate; therefore, they are not expected to be significantly impacted by the withdrawal.

Integrated air and ground training would increase ground disturbance, potentially harming vegetation and promoting the spread of noxious weeds. Vegetation likely to be affected would be species common to the region and would not be unique or sensitive species. The Navy currently has an Resource Management Plan for the control of noxious weeds on all Navy lands. These practices would be adopted to the withdrawn lands to minimize the spread of noxious weeds. The resource management plan for the withdrawn land (Appendix J) contains a noxious weed and weed management program.

Based on available data, aluminum-based chaff such as that used at NAS Fallon is not toxic to plants or wildlife (SEA 1989; Bohman 1991; Naval Research Laboratory 1995). A study conducted by the US Army Chemical Research, Development, and Engineering Center found that chaff is nontoxic to daphnia, mysid shrimp, and sheepshead minnows up to 1,000 mg/L. Using the chemical scoring system for hazard and exposure identification, the study concluded that the toxicity of chaff is ranked zero on a scale of zero to nine, with zero being nontoxic and nine being the most toxic (US Army 1992b). No studies on the long-term effects of chaff could be found.

In laboratory tests conducted by the US Air Force, the highest concentrations of aluminum occurred at pH 4 (170 ppm) and the lowest at pH 7 (0.3 ppm).

The freshwater acute value for aluminum is 1.496 ppm, and the chronic value is reported as 0.742 ppm for a pH range of 6.9 to 8.2. The extracts from the pH 7 samples, which lie within the 6.9-8.2 range, were approximately one-sixth freshwater acute value for aluminum. These extract values represent a very high chaff-to-water ratio (1:20), which could not occur in the environment. Therefore, aluminum toxicity due to chaff is not a concern in aquatic environments (US Air Force 1997).

Field observations conducted by the US Air Force at two military installations where chaff is frequently used and results of laboratory analyses of soil samples allow a number of conclusions to be drawn regarding the effects of chaff use on wildlife.

Based on the field survey results, chaff on land would generally be subject to disintegration due to abrasion from surface features in arid climates and chemical processes in wet, acidic environments.

The dispersal and decomposition of chaff fibers on land would limit the exposure of grazing animals to chaff, making it unlikely that ingestion of quantities large enough to have adverse physiological effects would occur. Plastic caps and cartridges are not likely to be eaten by wildlife and would have no effect on them.

Animals are unlikely to inhale chaff particles during chaff releases as the filaments drift to the ground due the size of the fibers and to the dispersal of the fibers in the air.

Due to the diameter and length of the filaments, chaff would not penetrate far into the respiratory system and would be easily cleared out. Relative to the background concentrations of dust in the air, the amount of additional particles contributed by chaff fibers would be negligible, and no adverse effects on wildlife would be expected from inhalation of the fibers.

The low visible accumulation of chaff fibers on the ground, even in arid environments, makes it unlikely that wildlife would have enough direct contact to cause any skin irritation.

Chaff fibers that land on standing water and float could potentially accumulate on the leeward side of the water body. It is likely that wildlife would avoid ingesting chaff, if possible, due to its unnatural appearance, but if a large quantity of chaff were mixed with plant material, it could be consumed by an animal while ingesting the vegetative matter.

The gizzards of surface-feeding ducks are not effective in dealing with such foreign materials. Ingested chaff would likely pass through the duck's digestive system as does fibrous plant material and not be harmful to the duck. However, if compaction of the chaff occurred in the gizzard, blockage of the digestive system could occur. Although individual animals could be affected, the number of incidents would be too low to impact species population. Impacts would be insignificant unless a protected species were affected.

Any effects on bats would be short term because chaff dissipates in the air (i.e., is dispersed by winds and settles to the ground) and because the bats would recover quickly from the confusion. Bats would not likely misinterpret the chaff particles as insects and so would not be likely to consume them. Since there is no evidence of heavy accumulation of chaff on the ground or water, avoidance of foraging areas by wildlife due to chaff is unlikely.

Given the wide ground dispersion patterns of chaff and its nontoxic nature, impacts to vegetation as a result of continued chaff operations are unlikely. Potential routes of exposure to fish and wildlife from continued deployment of chaff include ingestion of chaff fibers. Studies on livestock extrapolated to wildlife suggest that the consumption and retention of chaff is not likely to be biologically significant. In addition, no effects from chaff on wildlife have been observed at NAS Fallon, where chaff has been used for many years, though no definitive study of chaff effects on these ranges has been performed.

No adverse impacts are expected to wetlands from this alternative. Ground operations would avoid wetlands, including salt and alkali flats and drainages, to the greatest extent possible. Any activities that could adversely affect wetlands would be subject to regulation under the Clean Water Act.

Mitigation: The Navy will apply the Natural Resource Management Plan to withdrawn lands to control the spread of noxious weeds. To avoid impacts to migrating tarantulas, the Navy will not conduct ground training along Scheelite Mine Road during the migration periods. To reduce startle effects, no ground or low-level helicopter training below 500 feet AGL will take place within a one-half mile radius of springs and water troughs.

4.2.3.2 *Alternative II (Preferred Alternative)*

Impacts: Impacts resulting from this alternative would be similar to those of Alternative I. Impacts from developing EW, TACTS, and visual cueing device sites would occur in small areas and would avoid significant biological resources. Impacts from integrated air and ground training would be similar to those discussed for Alternative I, though less training would occur north of B-16.

Mitigation: Mitigations will be the same as discussed for Alternative I.

4.2.3.3 Alternative III

Impacts: As discussed under Alternatives I and II, no endangered or threatened species or associated habitat would be affected by this action. Impacts resulting from this alternative would be similar to those of Alternative II. As with Alternative II, less training would occur north of B-16 than under Alternative I.

Mitigation: Mitigations will be the same as discussed for Alternative II.

4.2.3.4 No Action Alternative

Impacts: The No Action Alternative would not adversely affect biological resources.

Mitigation: No mitigation required.

4.2.4 Air Quality

4.2.4.1 Alternative I

Impacts: This alternative would not have a significant direct impact on air quality. A Clean Air Act conformity determination is not required because NAS Fallon and the training ranges are not in a nonattainment area. The development and use of up to 50 visual cueing device sites would result in minor impacts to air quality from site development and the occasional operation of small engines to recharge battery packs. Potentially greater impacts could accompany development of EW or TACTS sites, which require more extensive earth-moving activities. Most impacts would be short-term impacts related to construction activities.

It is expected that up to five EW or TACTS sites would be developed, with a maximum size of five acres per site. Using an emission factor of 1.2 tons of fugitive particulate matter per acre per month (US EPA 1985) and assuming two weeks time to grade all five sites, the total emissions would likely be on the order of 15 tons of fugitive dust. Inhalable particulate matter (PM_{10}) ranges from 20 percent to 45 percent of fugitive dust. This would bring the emissions of PM_{10} from all sites combined to three to seven tons, or 0.6 to 1.4 tons per site. Dust control measures, such as watering the site, would reduce PM_{10} emissions by as much as 50 percent, resulting in emissions of 0.3 to 0.7 tons per site. Emissions of this magnitude would have a localized effect but would be of short duration and would not be cumulative because of the distance between sites. This would not be a significant impact.

In addition to particulate emissions from earth moving, there would be emissions from fuel-burning construction equipment. Exhaust emissions include nitrogen oxides (NO_x), carbon monoxide (CO), PM_{10}, hydrocarbons

(HC), and sulfur oxide (SO_x) compounds. Exhaust emissions were calculated using EPA AP-42 emission factors for heavy-duty construction equipment and are listed in Table 4-1. It was assumed that four pieces of construction equipment (dozer, scraper, grader, and track-type tractor) would operate eight hours per day for two weeks. These emissions, totaling approximately three tons, are not significant.

Potential long-term sources of emissions associated with operating the EW and TACTS sites would result from diesel-powered generators and routine vehicle traffic for operations and maintenance at the sites. These emissions are not expected to be significant because generators would be used for backup power only and because vehicles would operate only during changes in personnel and maintenance activities.

TABLE 4-1
EQUIPMENT EMISSIONS

	Emissions (tons/year)[1]				
Equipment	**NO_x**	**CO**	**PM_{10}**	**HC**	**SO_x**
Dozer	0.17	0.07	0.007	0.008	0.014
Scraper	0.15	0.05	0.016	0.01	0.019
Grader	0.03	0.006	0.003	0.002	0.004
Track-type Tractor	0.05	0.01	0.005	0.005	0.006
TOTAL for Each Site	0.40	0.14	0.03	0.03	0.04
TOTAL for Five Sites	2.0	0.71	0.15	0.13	0.21

Source: Developed by Tetra Tech using US EPA AP-42 emissions factors (EPA 1985)

[1] Assumes equipment operates two days per site at five sites for eight hours per day for a total operating time of two weeks.

Because foot traffic would be minimal and vehicle movement would be restricted primarily to established roadways and trails, dust and emissions from integrated air and ground training activities are expected to be insignificant. The use of helicopters during such training would increase dust when hovering or landing. This would be a localized and temporary effect.

The continued use of chaff and flares is not anticipated to have any air quality impacts. Chaff quantities released at one time are not great and do not break down to concentrations small enough that would affect air quality. No evidence has been found that chaff breaks down small enough to affect human health. According to chaff testing conducted by the US Air Force, it is believed that most chaff fibers maintain their integrity after ejection. Although some fibers are likely to fracture during ejection, it appears that this does not result in the release of PM_{10}. Although not significant, the tests indicated that the explosive charge in the impulse cartridge results in minimal releases of PM_{10}. Therefore, it appears that chaff deployment would not result in an exceedances of the national ambient air quality standards (US Air Force 1997). Flares emit small amounts of hazardous air pollutants, such as phosphorus. This would not be a significant impact because of the trace amount of hazardous air emissions, the short burn time (10 seconds), and because the flares are ignited primarily over the training ranges.

Mitigation: No mitigation required.

4.2.4.2 Alternative II (Preferred Alternative)

Impacts: Impacts from Alternative II would be similar to those of Alternative I.

Mitigation: No mitigation required.

4.2.4.3 Alternative III

Impacts: Impacts from Alternative III would be similar to those of Alternative I.

Mitigation: No mitigation required.

4.2.4.4 No Action Alternative

Impacts: No new development or integrated air and ground training would take place under the No Action Alternative except on existing lands administered by NAS Fallon. Future development could be constructed on public lands subject to BLM authorization. Air quality would not be impacted.

Mitigation: No mitigation required.

4.2.5 Noise

This section evaluates potential noise impacts resulting from each alternative. Noise effects on wildlife are discussed in Section 4.2.3.

4.2.5.1 Alternative I

Impacts: Alternative I would have no significant adverse noise impacts from jet aircraft operations because the land withdrawal would not result in an increase in aircraft operations and associated noise.

There would be no significant adverse impacts from construction or operation of the EW, TACTS, and visual cueing device sites. Construction could result in noise levels of up to 80 dB in the immediate vicinity of the site, however, noise levels would decrease with increasing distance from the site and would be temporary in nature.

Integrated air and ground training activities have the potential to disturb public land users in close proximity to operating helicopters. Since no integrated air and ground training operations would occur near residential areas, recreationists are most likely to be affected by noise. Those recreating north of B-16 or in the Dixie Valley area may be particularly affected. No specific information was available on the number of individuals using the proposed withdrawal area or the time of day, week, or year these individuals are present. Presumably, most land users are present during daytime hours on weekends. More than 90 percent of the integrated air and ground training would take place during the week, and approximately 50 percent of the training would occur at night.

Helicopter noise levels are discussed in Section 3.5.4. As discussed in this section, noise levels above 70 to 75 dBA could result in adverse effects to land users in the immediate area. Helicopters flying at altitudes of 100 feet above ground level would create adverse noise effects within about 100 feet on either side of the flight track (the distance on the ground from the receptor to the point under which the helicopter is flying). While it is standard operating procedure to avoid training near other land users, training activities would have the potential to significantly impact land users who were within this distance of the helicopter flight track.

There would be no noise impacts from the continued use of chaff and flares.

Mitigation: No mitigation required. However, the Navy will conduct noise studies to verify the Navy's position that there are no significant noise impacts associated with existing operations at B-17 and B-19.

4.2.5.2 Alternative II (Preferred Alternative)

Impacts: Impacts from construction of EW, TACTS, and visual cueing device sites, integrated air and ground training activities, and the continued use of chaff and flares would result in similar effects as those described for Alternative I. The smaller withdrawal area north of B-16 would result in less potential impacts from helicopter noise on recreationists. Noise impacts on specific resources are discussed in the appropriate resource section.

Mitigation: No mitigation required. However, the Navy will conduct noise studies to verify the Navy's position that there are no significant noise impacts associated with existing operations at B-17 and B-19.

4.2.5.3 *Alternative III*

Impacts: Impacts from Alternative III would be similar to Alternative II.

Mitigation: No mitigation required. However, the Navy will conduct noise studies to verify the Navy's position that there are no significant noise impacts associated with existing operations at B-17 and B-19.

4.2.5.4 *No Action Alternative*

Impacts: The No Action Alternative would not impact noise levels.

Mitigation: No mitigation required.

4.2.6 Visual Resources

4.2.6.1 *Alternative I*

Impacts: Potential impacts to visual resources could result from Navy activities, including EW, TACTS, and visual cueing device site development and air and ground training on the proposed withdrawal lands. Impacts can result from intrusion of new features whose outline, form, color, lighting, reflectivity, height, bulk, or shadow interfere with the perceived existing visual environment. The intensity of the impact would depend on the location of the activity, the visual characteristics in the area, and public accessibility of the area. Navy activities occurring in the foreground and middle ground would have a greater effect than activities located farther away. The areas of highest viewer sensitivity include the Highway 50 National Historic Corridor, Pony Express National Historic Trail, Dixie Valley Road, and Highway 95. The lands with the highest visual quality in the proposed withdrawal area include those lands in the wilderness study area and mountain ranges.

The Navy would develop up to five EW or TACTS sites and up to 50 visual cueing device sites in the Dixie and Fairview Valley areas and east of B-19. Typical developments for EW sites, TACTS sites, and visual cueing devices are shown in Figures 2-2 through 2-5. Most of these sites would be located in valley areas that have some existing development, including utility corridors, cow camp improvements, trails, and EW sites. The impact of individual future developments would vary at each location and would be reduced through standard operating procedures, including using colors that blend with the background and avoiding sensitive areas when siting the installations. Cumulative effects of past Navy actions on visual resources are discussed in Section 5.8.5.

The lands to be withdrawn are not to be used as impact areas. Some additional disturbance of Category A lands may occur from the use of live ordnance. These lands generally are not visible to the viewing public.

The development of fences designating Category A lands along existing roads could result in a visual effect to recreationists or travelers on nearby roadways, but this impact would not be significant because fencing is common throughout the region.

Integrated air and ground training would contrast against the rural visual character. The extent to which these activities were visible, particularly to sightseers and recreationists, would determine the significance of the impact. Activities clearly visible from sensitive viewpoints would result in potentially adverse impacts. Given that over 90 percent of the training is conducted during the week, that approximately 50 percent of the training is conducted at night, and that training is performed with the intent of remaining undetected, much of the training likely would remain unnoticeable. Training that was noticeable and that did affect the visual character of the setting would result in a potentially adverse impact.

Long-term chaff use could result in visible aluminum litter. However, because of its wide dispersion patterns, it is not expected that chaff or chaff debris would alter the regional viewshed. Long-term use of chaff and flares could result in an undesirable but insignificant accumulation of debris, particularly in the visually sensitive Job Peak WSA.

Overall, chaff debris has low visibility and little effect on the aesthetic quality of the environment. Chaff debris does not accumulate in quantities that make it objectionable, or even noticeable, to most persons in low-use areas. In addition, chaff debris is only visible in fairly open contexts where vegetation is sparse, along a road or pathway, or in cleared and maintained areas. Chaff fibers and debris may be noticed occasionally by outdoor recreationists but would not attract attention due to their small size or to their similarity to other familiar natural or manmade objects. In areas specifically protected to preserve naturalness and pristine qualities, such as the Job Peak WSA or other Wilderness Areas, users are more likely to perceive chaff debris as undesirable and unattractive since it conflicts with expectations of primitive character and management objectives to preserve naturalness (US Air Force 1997). However, because chaff would be disposed over a large area, any accumulation in this visually sensitive area would not cause a significant visual impact.

Mitigation: The visual impacts from chaff, though not significant, may be reduced if the Navy finds that the use of degradable chaff is viable and implements its use.

4.2.6.2 Alternative II (Preferred Alternative)

Impacts: Impacts to visual resources would be similar to those described for Alternative I, although the affected area would increase in the panhandle area and would decrease near the Job Peak WSA.

Mitigation: Mitigation will be as described for Alternative I.

4.2.6.3 Alternative III

Impacts: Impacts to visual resources would be similar to those described in Alternative I and II. This alternative would have the largest effect in the Dixie Valley area as the withdrawal boundary includes both a portion of the Job Peak WSA and the panhandle.

Mitigation: Mitigation will be as described for Alternative I.

4.2.6.4 No Action Alternative

Impacts: Development of EW sites and integrated air and ground training would not take place except on existing lands administered by NAS Fallon; therefore, no visual impacts would occur.

Mitigation: No mitigation required.

4.2.7 Cultural Resources

4.2.7.1 Alternative I

Impacts: No significant impacts to cultural resources as a result of this alternative are anticipated. All proposed site developments are subject to compliance with the National Historic Preservation Act (NHPA) and with the procedures set forth in the NAS Fallon CRMP and PA (US Navy 1993a). Prior to any undertaking, the Navy will examine the areas of potential effects for cultural resources. With regard to management policy, the Navy will be the lead agency in cultural resource site surveys done for its projects to avoid potential impacts to cultural resources on the proposed withdrawn land.

Integrated air and ground training activities would not have significant impacts to cultural resources from disturbing and degrading cultural resource sites near the ground surface. The Carson Desert predictive model would be one tool used to delineate areas potentially containing surface and subsurface resources. These areas would not be used for ground training until appropriate surveys were conducted. The Navy would attempt to avoid those areas potentially containing cultural resources when conducting air and ground training operations. Where areas cannot be avoided, appropriate consultation and mitigation will be undertaken. The ground training portion of integrated air and ground training would be dispersed over a wide area and any vehicles would use existing roads and trails, reducing effects to cultural resources. Officers in charge of ground training operations will be provided information to assist them to avoid damage to culturally valuable areas.

The predictive model also will be used while siting EW, TACTS, and visual cueing device sites to aid in avoiding areas with a high probability of containing cultural resources. Project-specific cultural resource surveys will be conducted at each potential site to ensure that resources are avoided. If areas cannot be avoided, appropriate consultation and mitigation will be undertaken as outlined in the CRMP and PA.

Native American consultation and coordination with interested and affected Native American groups will be conducted to identify areas of traditional use or to identify specific concerns. The consultation process would involve the Nevada State Indian Commission, the Nevada SHPO, Bureau of Indian Affairs, and interested individuals and tribal entities identified during the project scoping process.

The only circumstance in which chaff debris has the potential to significantly affect the setting of a cultural property is if large quantities of chaff debris accumulate in a confined area, such as an architectural site or district or an archaeological site that attracts visitors. This situation is highly unlikely because these types of resources are not located beneath airspace where heavy chaff use would be concentrated (US Air Force 1997).

Mitigation: No mitigation required.

4.2.7.2 Alternative II (Preferred Alternative)

Impacts: Impacts resulting from Alternative II would be similar to those of Alternative I.

Mitigation: No mitigation required.

4.2.7.3 Alternative III

Impacts: Impacts resulting from Alternative III would be similar to those of Alternative I.

Mitigation: No mitigation required.

4.2.7.4 No Action Alternative

Impacts: The No Action Alternative would not result in direct impacts to cultural resources as no lands would be withdrawn.

Mitigation: No mitigation required.

4.2.8 Land Use

Potential adverse land use impacts from the alternatives include impacts to mining, livestock grazing, and recreation. Potential impacts to these uses are discussed in Sections 4.2.10, 4.2.11, and 4.2.12, respectively.

4.2.8.1 Alternative I

Impacts: This alternative withdraws approximately 189,080 acres, the largest amount of withdrawn lands among all of the alternatives. The following direct impacts could occur from the land withdrawal:

- *Closure of Category A Lands.* Under this alternative, a maximum of 40,280 acres would be identified as Category A lands. Public access would be prohibited, and no mining, grazing, building, or issuing of new leases, ROWs, or easements would be allowed under this classification. This would be an unmitigable impact. Restricted public access is not consistent with the BLM Lahontan Resource Management Plan, which promotes multiple public uses. However, these restrictions are necessary to assure public safety. The RMP developed for withdrawal lands will amend the BLM Lahontan Resource Management Plan and will reclassify these areas as closed to public use.

- *Development of Structures in Category B Lands.* Category B lands contain utility corridors or rights-of-way that currently provide for structures over 50 feet. Rights as established by existing corridors and rights-of-way will not change. However, future development of structures over 50 feet high could be prohibited. Grant or issuance of new rights-of-way by the BLM would be subject to Navy review and approval and could contain a general height limitation of 50 feet for structures including, but not limited to, transmission lines.

  The withdrawal would have a potentially adverse impact to future development in these corridors if structures over 50 feet were prohibited. The Navy will accommodate the height requirements of holders of utility corridors and rights-of-way, subject to existing rights. New construction, including extensions to existing structures, would be subject to policies presented in the resource management plan (Appendix J) and would require Navy approval.

  Navy integrated air and ground training would take place on proposed withdrawal lands using helicopters, vehicles on established roads and trails, and foot traffic elsewhere. The BLM Lahontan Resource Management Plan (RMP) does not include provisions for managing military training activities; however, the withdrawal would be managed for such uses. Category B lands used for training purposes will remain open to the public.

The use of developed Navy sites for visual cueing devices will be short-term and will restrict only temporarily any public access. For more permanent Navy installations, such as EW and TACTS sites, restrictions to public access are unmitigable impacts. These should not be significant, however, since the amount of land that would be affected is relatively small.

- *Geothermal Production and Oil and Gas Leases.* Geothermal energy is produced 30 miles north of the proposed withdrawal area, and a transmission line has been constructed parallel to the Dixie Valley Road in that area. The ultimate load capacity of the transmission line is approximately 150 megawatts, with an initial capacity of 50 megawatts. The height of the transmission poles in the proposed withdrawal does not exceed 50 feet. If the transmission poles require further modification in the future, Navy approval would be required. Restrictions on future structures could result in adverse effects. The Navy would coordinate with other regulatory agencies, including the BLM and Federal Electric Regulatory Commission (FERC). The withdrawal action would not affect the development of this site or exploration of the area. No geothermal resources are known to exist on Category A lands; therefore no impacts are expected to geothermal production. No oil and gas leases exist within the Alternative I withdrawal footprint.

- *Constraints to Development of Churchill County and the City of Fallon.* Anticipated development patterns and development constraints are described in Section 3.8. Since the land proposed for withdrawal around B-16 is already managed by the federal government (BLM or BUREC), the land withdrawal is essentially a joint change in jurisdiction and land management from one federal agency to another. Therefore, the land withdrawal would place no additional jurisdictional constraints on development west of the City of Fallon.

- *Job Peak Wilderness Study Area.* A portion of the Job Peak WSA is in the northern portion of the Alternative I Dixie Valley area withdrawal footprint. While the final decision on land status will be made by Congress, the BLM has not recommended this WSA for wilderness designation. The Navy has no plans for new actions that would impair the wilderness characteristics of lands in the Job Peak WSA or that would restrict public access to the WSA. Should the WSA be designated a wilderness area, it would be removed from the land withdrawal.

Mitigation: The Navy will waive height limits in cases where exceeding 50 feet is necessary for a short-term development, such as for an oil well, and where such a waiver does not pose a safety hazard to aircrew. Permanent nonconforming structures also might be allowed in some areas if, in the judgment of the Navy, such structures were compatible with Navy training uses. Such areas will be defined in the resource management plan.

4.2.8.2 Alternative II (Preferred Alternative)

Impacts: The following land use impacts would be similar to those under Alternative I:

- The Category A lands closed because of existing and potential off-range ordnance would still be withdrawn under this alternative and the impacts to public use would be the same as described under Alternative I.
- The restrictions to structure height on Category B lands would be the same as under Alternative I. As under Alternative I, the use of Category B land for non-Navy development would require BLM, BUREC, or DOE approval and Navy review and approval.

The following impacts will differ from those under Alternative I:

- Reducing the Dixie Valley area to 68,600 acres would move it outside the boundary of the Job Peak WSA, thereby eliminating any potential effects to this area from land withdrawal activities.
- One oil and gas lease exists in the panhandle area under this alternative. Were restrictions imposed on operating this existing lease, a potentially adverse impact would occur.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.8.3 Alternative III

Impacts: Impacts under this alternative would be the same as described for Alternative I, including effects to the Job Peak WSA. Geothermal impacts would be the same as described under Alternative II.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.8.4 No Action Alternative

Impacts: Under this alternative, no lands would be withdrawn. Lands under emergency closure would remain closed to public use. Training capabilities at

NAS Fallon would be impacted because integrated air and ground training and EW site development would not be allowed except on existing lands administered by NAS Fallon.

The BLM Lahontan Resource Management Plan does not address public and aircrew safety concerns around training ranges and does not restrict potential incompatible uses, such as the development of tall structures within target ingress routes. The inability of the Navy to restrict such conflicting land uses would not be guaranteed under this alternative, resulting in a potentially adverse impact to the Navy training mission.

Mitigation: NAS Fallon will coordinate closely with the BLM to have incompatible uses and developments controlled.

4.2.9 Environmental Justice and Socioeconomics

This section evaluates the potential impacts to the regional socioeconomic environment and addresses environmental justice issues. Consistent with the SECNAV Notice 5090.6 of July 26, 1994, and Executive Order 12898 of February 11, 1994, it is the Navy's policy to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations. Table 4-2 outlines elements of the Navy policy and the actions taken to address these elements.

4.2.9.1 Alternative I

Impacts: The proposed land withdrawal will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations. Any effects resulting from implementation of the land withdrawal in this alternative would affect equally all segments of the population in and around NAS Fallon and the training ranges. Category A lands would be closed with no public access, and Category B lands would remain open to most public uses.

Impacts to members of the Walker River Paiute Tribe and the Paiute-Shoshone Tribe of the Fallon Reservation and Colony were examined, given the proximity of these lands to the project area. The land withdrawal would not disproportionately affect these groups under this alternative because the withdrawal does not involve Native American land and because Navy operations near the lands would not increase. In addition, Native American populations do not use the proposed withdrawal lands for grazing, mining, or recreation in a higher proportion than other segments of the population. The withdrawal would affect equally all members of the region of influence because any land management restrictions would be applied equally to all racial and income groups.

TABLE 4-2
ENVIRONMENTAL JUSTICE

SECNAV Notice 5090.6	Navy Action
Analyze the human health, economic, and social effects of Department of the Navy actions, including effects on minority communities and low-income communities.	Potential social and economic impacts have been assessed and are discussed in this section.
Ensure that whenever feasible, mitigation measures outlined or analyzed in the environmental impact statement, or record of decision, address significant and adverse environmental effects of proposed federal actions on minority communities and low-income communities.	It was determined that any beneficial or adverse impacts would affect all parts of the population equally for Alternatives I, II, III, and the No Action Alternative.
Ensure that opportunities for community input in the NEPA process are provided, including identifying potential effects and mitigation measures in consultation with affected communities and improve the accessibility of meetings, crucial documents, and notices.	Public scoping was conducted in 1982, 1987, and 1995. Scoping activities included publishing notices in local newspapers, meeting with government agencies and Native Americans, and holding public meetings. In addition, the BLM held an open house in 1996. Notices on scoping and public hearings on the Draft EIS were distributed to the Walker River Paiute Tribe. The Navy met with representatives of the Bureau of Indian Affairs and members of potentially affected Native American groups on November 7, 1995, to discuss the proposed action. These activities are detailed in Appendix A of this document.
Ensure that the public, including minority communities and low-income communities, has adequate access to public information relating to human health or environmental planning, regulation, and enforcement.	The Draft and Final EIS will be made available to the public at all affected community public libraries. A copy may also be obtained from the Navy upon request. The Navy point-of-contact is listed on the cover sheet at the beginning of this document. All supporting documents are available to the public by request.

For socioeconomics, the number of jobs at NAS Fallon would not change under Alternative I. Potential direct adverse socioeconomic impacts from Alternative I include impacts to mining, livestock grazing, and recreation; these impacts are discussed in Sections 4.2.10, 4.2.11, and 4.2.12, respectively. Generally, a reduction of employment or economic opportunities is seen as a negative socioeconomic impact. Payments in lieu of taxes would not decrease under any of the alternatives because in Churchill County these payments are determined by population rather than the number of acres held by the BLM.

Private residential development near the lands proposed for withdrawal around B-16 has been active in recent years. Development could slow down as a result of this alternative resulting from public perception that a significant change in land use management has occurred. However, the slowdown probably would be short-term and would not result in a reduction in local real estate values.

No socioeconomic impacts from activities such as integrated air and ground training, construction of EW sites, and the temporary placement of active or passive cueing devices would occur. These activities are expected to be dispersed over a wide area. No impacts to socioeconomics would result from the construction of EW or TACT sites, as these sites would be located to avoid existing mining and grazing activities.

This alternative could result in socioeconomic impacts if valid mining claims located on proposed Category A lands were not developed. Prohibitions against grazing on Category A lands could also result in socioeconomic impacts. Total regional recreation income may decrease as Category A lands are closed to public access. This alternative could result in lost economic benefits in the community.

Mitigation: The loss of mining and grazing revenue is an unmitigable impact. The Navy will explore means to compensate holders of any valid mining claims or grazing permits on the withdrawn lands, subject to congressional authorization and appropriation. The Navy will conduct noise studies to verify the Navy's position that there are no significant noise impacts associated with existing operations at B-17 and B-19.

4.2.9.2 *Alternative II (Preferred Alternative)*

Impacts: Impacts described for Alternative II would be similar to those of Alternative I. Decreases in regional recreation income would be less substantial since Sheckler Reservoir would not be included in the withdrawal.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.9.3 *Alternative III*

Impacts: Impacts under Alternative III would be similar to Alternative II, with the addition of more extensive development restrictions near the Dixie Valley area.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.9.4 *No Action Alternative*

Impacts: No land would be withdrawn under this alternative. Integrated air and ground training, development of EW and TACTS sites, and use of visual cueing devices would not occur under this alternative except on existing lands administered by NAS Fallon. This alternative would not affect residential development.

Mitigation: No mitigation required.

4.2.10 Mineral Resources

Impacts to mineral resources would be influenced by the existence of minerals within the land withdrawal area, the availability of the lands to extract those minerals, and the land use controls applied to mining operations on the land. Potential direct impacts associated with the land use controls are described below.

4.2.10.1 Alternative I

Impacts: Under all withdrawal alternatives, Category A lands would be closed to any mining activity to protect the public from existing and potential off-range ordnance. Mining would be allowed on Category B lands subject to existing mining laws but the Navy will have final approval authority on permits for claim improvements and no claims may be patented after the lands are withdrawn.

The following discussion on locatable minerals applies to the entire withdrawal area except for the shoal site and those lands in the B-16 area withdrawn by BUREC. These areas were withdrawn from mineral entry prior to the Navy's application for land withdrawal.

- *Exploration.* Significant unmitigable impacts would occur on Category A lands because no exploration may take place. The greatest impact would occur on Category A lands with high mineral potential. Approximately 2,200 acres in the Fairview District south and east of B-17 and 2,300 acres in the Cinnabar Hill area east of B-19 would be affected.

  Casual exploration on Category B lands would be allowed except at military sites. This would not be a significant direct impact because these sites are small, are dispersed over a wide area, and are unlikely to affect exploration.

- *Mining Claim Location (Staking New Claims).* Significant unmitigable impacts would occur on Category A lands because no claims may be located.

  No controls to locating mining claims on Category B lands would occur except at EW, TACTS, and visual cueing device sites during the time of their use. This would not be a significant direct impact because developed military sites would occupy a small percentage of the withdrawal area and would avoid areas with high mineral potential or existing claims.

- *Development.* Significant unmitigable impacts would occur on Category A lands because access to unpatented and patented claims would not be allowed, potentially resulting in a loss in revenue and, in the case of patentees and holders of valid unpatented mining claims, a loss of private property or mineral rights.

Applications for BLM permits for mining on Category B lands would require Navy review and approval. Approval would be granted where development was compatible with Navy training operations. Development on fenced military sites would not be permitted. In the case of visual cueing device sites, this impact would be temporary, as the sites could be developed once the visual cueing device was moved. Five permanent EW and TACTS sites, comprising at most twenty-five acres, would be located to avoid existing developments. This would not be a significant direct impact.

- *Patenting*. Significant unmitigable impacts would occur on Category A lands because no claims may be patented.

No new patents would be allowed on Category B lands after the withdrawal. While unpatented claims still guarantee the claimant exclusive rights to the minerals in the claim, restricting patenting would result in potentially adverse impacts. Maintaining claims in an unpatented status would continue to require paying an annual fee and obtaining permits for any improvements. Maintaining the claims in an unpatented status also would preclude a claimant from the land ownership that accompanies patenting a claim. These adverse effects would be limited in that there are no areas with high mineral potential within the Category B lands except in the Wonder District (Figure 3-9).

Impacts to leasable minerals could result from controls on access to Category B lands and on the height limitation of structures. The height limitation could affect oil, gas, and geothermal well drilling, as this equipment often exceeds 50 feet. In addition, no new leases could be issued on Category A lands. These impacts are not projected to be significant since the mineral inventory revealed no lands in the withdrawal area with high leasable mineral potential.

Potential impacts to salable minerals could result from restrictions to development on Category A lands. The current sites (managed by NDOT and located in the EW and B-17 proposed withdrawal areas along Highway 50, the Sheelite Mine Road, and the Dixie Valley Road) are considered valid existing rights. There are vast quantities of salable materials on the lands outside the proposed withdrawal area; therefore, no significant impacts to access of salable minerals are anticipated.

Mitigation: The Navy will explore means to compensate holders of impacted mining patents and valid unpatented mining claims on Category A lands.

Acquisition of these claims and patents will be subject to congressional authorization and appropriation.

With regard to height limitations on development structures in Category B lands, waivers could be issued by the Navy on a case-by-case basis, depending on the proposed location and duration of time the structure will be needed. The Navy will explore the possibility of accommodating equipment necessary for oil, gas, and geothermal drilling if it is to be installed for relatively short periods or in locales where it does not pose a safety hazard to military operations.

4.2.10.2 Alternative II (Preferred Alternative)

Impacts: The land use category designations for Alternative II are the same as those for Alternative I and impacts would be similar to those described for Alternative I. The primary exception would be for those lands not included in the Alternative II withdrawal area, including land in the Wonder District (including the Silver Center Claims) and Sand Springs District. The Wonder District and portions of the Sand Springs District have been identified as having high mineral potential, so removal of these areas from the withdrawal would lessen the impacts.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.10.3 Alternative III

Impacts: Impacts under Alternative III would be similar to those described under Alternative I.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.10.4 No Action Alternative

Impacts: The No Action Alternative would not withdraw any public lands. Impacts to mining on off-range ordnance lands would continue to be handled through BLM and Navy administrative processes.

Mitigation: No mitigation.

4.2.11 Livestock and Wild Horse Management

4.2.11.1 Alternative I

Impacts: Alternative I would not significantly affect livestock or wild horses on Category B lands. Grazing activities and wild horses would not be allowed on fenced developed military sites but would be permitted on unfenced sites. The fenced lands would total a maximum of 75 acres within the proposed withdrawal lands. The Lahontan Resource Management Area lands average 30 acres per animal unit month (AUM), although the number of acres per AUM varies widely between grazing allotments. Based on the average, this means that approximately two AUMs of grazing preference could be lost from military developments under this alternative. This impact is not significant. Military sites would be located to avoid livestock grazing improvements, such as water troughs and water storage tanks, thereby reducing any effects.

No livestock grazing activities would be allowed on Category A lands. As many as 240 AUMs east of B-19 and 890 AUMs north, south, east, and west of B-17 could be affected. This loss represents 15 percent of the AUMs in the Bass Flat grazing allotment, 14 percent of the AUMs in the La Beau Flat grazing allotment, and three percent of the AUMs in the Clan Alpine grazing allotment, or 1.4 percent of the 80,000 AUMs in the Lahontan Resource Management Area. No wild horse herd management areas (HMAs) are located within proposed Category A lands.

The continued use of chaff would not adversely affect livestock. The materials in chaff are nontoxic and are not harmful to livestock (SEA 1989; Bohman 1991; Naval Research Laboratory 1995). As noted in the Naval Research Laboratory paper, tests of chaff by the Canadian Department of Agriculture for the Canadian Armed Forces found that chaff passes through the digestive system of cattle with only insignificant amounts retained in the body. University of Texas research drew similar conclusions on tests of goats and sheep. Communications between the Air Force Occupational and Environmental Health Laboratory and the Chairman of the Department of Dairy Husbandry, College of Agriculture, at the University of Wisconsin, indicated similar studies were completed on cattle and goats with the conclusion that chaff presents no health hazards to farm animals. In addition, the study performed by the Canadian Department of Agriculture found that calves rejected ingesting chaff in clumps 0.5 ounces in weight or when scattered among dry meal rations; they ingested the chaff only when it was scattered evenly in their hay (as referenced in Naval Research Laboratory 1995).

Previous studies have been conducted to address ingestion effects of chaff on animals. Cattle and goats apparently avoided eating clumps of chaff placed in their feed. Calves fed chaff in dry meal would consume the chaff only when it was coated with molasses and thoroughly mixed into the meal (as discussed in US Air Force 1997). A similar study using cattle and goats found that the animals avoided consuming intact chaff (as discussed in US Air Force 1997).

No evidence of digestive disturbance or other clinical symptoms were observed in calves fed chaff (as discussed in US Air Force 1997). The experimental and control groups gained weight at the same rate, and blood samples showed no deviation from normal. Postmortem examinations of the digestive system and major organs showed no lesions of pathological significance that could be attributed to chaff.

Inhalation of chaff fibers is not expected to have any adverse effects on terrestrial wildlife due to the sizes of the fibers. A study on the potential for inhalation by livestock and humans showed that the chaff fibers are too large to penetrate the larynx and would be expelled through the nose or swallowed (UKHSEMD 1988).

No significant impacts to livestock or wild horses are expected to result from integrated air and ground training or siting visual cueing devices, although the use of helicopters and vehicles may startle wild horses and cattle, causing stress. These activities would be temporary and dispersed over a large area. Noise studies evaluating the effects of military operations on ungulates show that any physiological effects tend to be short-term (approximately two minutes) and that the animals quickly habituate to noise disturbances (Workman et al. 1992; Krausman 1993a, b, and c; NDOW 1989). The activity areas would be sited to avoid water developments where livestock and wild horse tend to congregate. Cattle operations would not be disturbed.

Mitigation: The Navy will explore means to compensate holders of affected grazing permits, subject to congressional authorization and appropriation. To minimize startling cattle and wild horses, the Navy will not conduct ground training or low-level flights below 500 feet AGL within a one-half mile radius of all springs and water troughs.

4.2.11.2 Alternative II (Preferred Alternative)

Impacts: Alternative II would result in impacts similar to those of Alternative I. The same number of AUMs around B-17 and B-19 would be affected on Category A lands as described under Alternative I.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.11.3 Alternative III

Impacts: Alternative III would result in impacts similar to those under Alternative I. The same number of AUMs would be affected on Category A lands as described under Alternative I.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.11.4 No Action Alternative

Impacts: Impacts to grazing on off-range ordnance lands would continue to be handled through BLM and Navy administrative processes.

Mitigation: No mitigation.

4.2.12 Recreation and Public Access

4.2.12.1 Alternative I

Impacts: Impacts to recreation that could result under this alternative include limitations on recreational opportunity and decreased quality of recreational experience in the withdrawn areas.

The greatest direct recreation and access impacts would occur on Category A lands that would be closed to public access. While lost recreational opportunities on Category A lands is an unmitigable impact in and of itself, recreational opportunities exist in the area on lands with a higher recreational value. In addition, Alternative I would withdraw a portion of the Job Peak Wilderness Study Area.

Few restrictions to recreation or public access would occur on Category B lands. Access would be restricted only on the small percentage of land containing EW, TACTS, and visual cueing device sites and events needing BLM permits would require Navy review and approval to avoid conflicts between Navy and public users. Approval will be granted if the proposed recreational use is compatible with Navy training operations.

Proposed Navy actions on Category B lands, including site development, placement of visual cueing devices, and integrated air and ground training, could affect the recreational character of the area. The presence of these activities, particularly in the Dixie Valley area and near the Sheckler Reservoir, could alter the social character from relatively undeveloped and unrestricted to developed and restricted. A military presence on Category B lands, particularly if integrated air and ground training is evidenced, may discourage use of the lands for recreation even though recreation itself would not be restricted.

No data are available on the numbers of recreationists that use different parts of the proposed withdrawal area, though the number of people in general is not thought to be very high. Most integrated air and ground training would occur at the times when encounters with recreationists are least likely, reducing the frequency of potential impacts. Impacts to a small number of individuals are still likely to exist, especially for recreationists seeking a backcountry setting if the nature of that setting is altered.

The proposed land withdrawal would not affect the Pony Express National Historic Trail. The trail itself is not on the withdrawal lands, and access along the trail would not be prevented at any time. EW, TACTS, or visual cueing device sites along the trail may affect the character of the land along the trail. Aircraft entering B-17 from the Dixie Valley overfly the Pony Express National Historic Trail, which could detract from the "historic period" character of the trail. This is discussed in Section 4.2.6, Visual Resources.

Potential adverse effects to recreational experiences could result from the continued use of chaff and flares. Recreationists could encounter residual debris, thereby reducing the perceived natural and remote character of the region. This impact is not expected to be significant because contact with chaff and flare debris would be infrequent and because of their small size or their similarity to other familiar natural or manmade objects (US Air Force 1997).

Mitigation: Access and recreational impacts resulting from the closure of Category A lands are not mitigable. Because these lands are ordnance-contaminated or have the potential to be contaminated, it is not possible to allow recreation and public access while preserving public safety. If the Job Peak Wilderness Study Area is afforded wilderness designation, the Navy would remove the WSA from its withdrawal footprint. The Navy will provide education program materials on Navy training activities on Category B lands to the BLM, NDOW, and BUREC for public distribution. The Navy will make every effort to avoid the public during ground training activities. If there is an organized annual re-enactment of the Pony Express Trail ride, the Navy will work with trail personnel to alter flight activities during the event if compatible with training needs at the given time.

4.2.12.2 Alternative II (Preferred Alternative)

Impacts: Impacts to recreational use and access under this alternative would be similar to those described under Alternative I. The Sheckler Reservoir and Job Peak WSA are not included in the withdrawal area under this alternative. Recreational uses at these areas would, therefore, not be affected. Access to and use of the historic trails, such as the Pony Express National Historic Trail, would not be affected by the action.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.12.3 Alternative III

Impacts: Alternative III would result in impacts and mitigations similar to those under Alternative II, with the addition of impacts from withdrawal of lands in the Job Peak WSA, as described for Alternative I.

Mitigation: Mitigation measures will be the same as described for Alternative I.

4.2.12.4 No Action Alternative

Impacts: The No Action Alternative would not withdraw any public lands. Impacts to recreation on emergency closure lands would continue to be handled through Navy and BLM administrative processes.

Mitigation: No mitigation required.

4.2.13 Public Health and Safety

4.2.13.1 Alternative I

Impacts: The proposed withdrawal was engendered in part by safety considerations, both for Navy aviators who train over existing ranges and for non-Navy users of the land proposed to be withdrawn. Under this alternative, the potential withdrawal lands would serve primarily as buffer zones around the NAS Fallon ranges, with the various concurrent controls on land use to prevent exposure of people and property to hazardous situations. Navy approval would be required for access to developed military sites. Public use would be excluded from Category A lands. This alternative would benefit public health and safety by improving public protection from existing and potential off-range ordnance.

No significant impacts to public health and safety would result from Navy ground activities, such as training, siting visual cueing devices, and constructing EW and TACTS sites. Localized electromagnetic radiation (EMR) at the EW sites presents no hazard to public health and safety. A study performed by the Naval Warfare Assessment Division in August 1995 at the existing NAS Fallon EW sites found that a standard cellular phone exposes a user to approximately 10 times more EMR than standing next to an active EW site. The sites would be fenced to prohibit unrestricted public and animal access, warning signs would be posted, and the sites would have lights to notify anyone if a unit is turned on or is about to be turned on.

There is no known documentation of the effects of human exposure to chaff, but none of the materials contained in chaff are known to pose a health hazard. Based on the data available, the materials (aluminum, stearic acid, and silica fiberglass) are irritants and thus pass easily through the systems of animal species that ingest them (SEA 1989; Bohman 1991). Based on US Air Force reviews of numerous toxicological studies, these principle components of chaff are unlikely to have significant effects on humans and the environment, based upon the general toxicity of the components, the dispersion patterns, and the unlikelihood of the components to interact with other substances in nature to produce synergistic toxic effects (US Air Force 1997). Chaff does not break down into particles small enough to be an inhalation risk, nor does the type of chaff used at NAS Fallon cause allergic contact dermititis. Chaff manufacturers, when contacted, revealed no instances of allergies or irritation among their employees (Naval Research Laboratory 1995). There is a potential for chaff-related nuisance effects to the public from degradation of radio, radar, and other electronic signals. However, adverse effects are avoided by standard operating procedures, such as clearing major chaff releases with the appropriate FAA facilities. In addition, the new RR-188 chaff, which includes no dipoles cut to the RF bands used by FAA radars, is available for use in training by most aircraft. Aircraft that cannot use this model must obtain a frequency clearance prior to use.

The probability of debris from the chaff system hitting a person on the ground would be dependent on many variables (e.g., location of use, population density beneath airspace, frequency of use, etc.). Ejected debris consists of the chaff itself, possibly a cardboard box which contains the chaff, flat plastic package stiffeners, a small plastic piston, and a small plastic end cap. Under normal circumstances, all of those elements weigh so little, or create so much drag in comparison to their weight, no injury would be anticipated even if a person were impacted.

In 1997, the US Air Force reviewed all available literature dealing with safety issues involving chaff use and the operation of chaff dispensing systems, reviewed records of accidents and mishaps experienced with chaff use, and analyzed chaff safety issues using protocols established for Air Force System Safety evaluations. Based on this assessment of available data and analysis of possible events, the US Air Force calculated that there is little safety risk to aircrews, aircraft, or the public anticipated from the use of chaff (US Air Force 1997).

None of the land withdrawal alternatives would increase the potential for aircraft mishaps, as detailed in Section 3.13. The studies detailed in Chapter 1 take into account the potential for aircraft mishaps, and the footprints were drawn accordingly to protect the public from this hazard. Vehicle traffic on the Dixie Valley Road would increase with integrated air and ground training and moving visual cueing devices. Current road conditions are sufficient to handle increased traffic.

Mitigation: No mitigation required.

4.2.13.2 Alternative II (Preferred Alternative)

Impacts: Alternative II would have beneficial impacts similar to Alternative I, particularly in protecting the health and safety of persons using the proposed withdrawal lands.

Mitigation: No mitigation required.

4.2.13.3 Alternative III

Impacts: Alternative III would result in beneficial impacts similar to Alternative I.

Mitigation: No mitigation required.

4.2.13.4 No Action Alternative

Impacts: The No Action Alternative would not withdraw any public lands, including off-range ordnance lands. While the public still would be restricted from accessing these lands, the BLM does not have the same resources available as the Navy to patrol these lands and to ensure they are not being accessed. The safety conditions and land use compatibility problems identified in the RAICUZ and HAZARD studies would not be rectified. These problems could be mitigated only by curtailing Navy activities, which would not meet the requirements of the training mission.

Mitigation: Public safety impacts from off-range ordnance are not mitigable. The Navy would request that the BLM restrict development in potentially hazardous or incompatible use areas.

4.2.14 Transportation

4.2.14.1 Alternative I

Impacts: Alternative I would not affect the major highways in the region. The southern boundary of the Dixie Valley area and the northern boundary of the proposed withdrawal around B-17 do not include the right-of-way (ROW) for Highway 50. Southbound Route 95 from Fallon passes through the land proposed for withdrawal to the west of B-19. The highway and the associated ROWs would not be withdrawn. Therefore, the use of Highway 50 and Route 95 by the public would not be impacted. Public use would not be restricted along Dixie Valley Road because it borders Category B lands that would remain open for public access and use.

Local roads historically used to access mining areas would be located in Category A-designated lands. These roads include local roads off Highway 50 that provide access to the Nevada Hills Mine and other mines around it. These roads currently are closed under the BLM emergency closure action and would continue to be closed to public use in all alternatives. While alternative routes may be identified, the loss of an existing road is an unmitigable impact. A gas line service road east of B-19, which has been swept and cleaned, was recently reopened even though it is located in an area identified as containing off-range ordnance. A 200-foot corridor is fenced to allow road access, and the road is swept annually for off-range ordnance. The road would remain open for public access under the proposed land withdrawal. This is possible because soil-to-bedrock conditions are shallow, which doesn't permit ordnance to be buried under the surface. Off-range ordnance would remain on the surface and would be easily identified and collected by the explosive ordnance disposal team. In addition, training operations at B-19 have been altered to greatly reduce the potential for off-range ordnance to fall in this corridor.

Public access across the developed EW, TACTS, and visual cueing device sites generally would not be permitted. However, because these 55 sites are relatively small and dispersed throughout a large area, this impact is not expected to be significant. Road conditions are adequate to handle any additional traffic from site construction, moving visual cueing sites, and integrated air and ground training. Therefore, these activities are not expected to have a significant impact.

No increase in local traffic is expected to occur as a result of the proposed land withdrawal.

Mitigation: The land use categories proposed for Alternative I include provisions to minimize possible disruption of transportation within the project area. Alternate transportation routes will be identified for any through roads that are closed. Road closure on Category A lands is unmitigable.

4.2.14.2 Alternative II (Preferred Alternative)

Impacts: Impacts would be similar to those described for Alternative I.

Mitigation: Mitigation measures are as described under Alternative I.

4.2.14.3 Alternative III

Impacts: Impacts would be similar to those described for Alternative I.

Mitigation: Mitigation measures are as described under Alternative I.

4.2.14.4 No Action Alternative

Impacts: The closure of roads into the off-range ordnance lands would continue to be addressed through Navy and BLM administrative processes.

Mitigation: No mitigation.

4.2.15 Airspace Designation and Use

4.2.15.1 Alternative I, II, III and No Action Alternative

Impacts: These alternatives would not affect airspace designation or use.

Mitigation: No mitigation required.

4.3 UNAVOIDABLE ADVERSE IMPACTS

Based on the alternative analysis, the following are potential direct unavoidable impacts for each alternative. Unavoidable impacts in this section include those impacts that cannot be mitigated to a less than significant level. All potential direct impacts by resource category and alternative are summarized in Table 2-6.

Alternatives I, II (Preferred Alternative), and III

Potential impacts to mining, grazing, water rights, and recreation on Category A lands could result in significant unmitigable impacts. These impacts include loss of access to valid claims and loss of revenue from areas that would otherwise be mined, loss of AUMs, and foregone recreational opportunities.

No Action Alternative

The No Action Alternative would adversely impact public health and safety because the off-range ordnance lands and lands identified in the HAZARD report as needed to contain ordnance employed in training would not be under Navy control. This alternative also would adversely affect the realism and effectiveness of training operations.

4.3.1 Local Short-term versus Long-term Productivity

The withdrawal would not affect the productivity of the land, although there would be a reduction in economic productivity arising from impacts to commercial uses such as mining. Short- and long-term protection of the public from off-range ordnance would be a positive impact of the withdrawal action. Integrated air and ground training would have an adverse effect on the short-

and long-term productivity of recreational opportunities on withdrawn Category A lands.

Under the No Action Alternative, the benefit of short- and long-term protection of the public from noise and safety incidents from high-speed and low-altitude flights and aerial maneuvers would not occur. In addition, the long-term viability of the existing FRTC could be endangered through the encroachment of incompatible land uses.

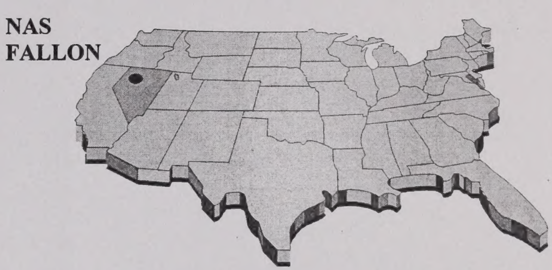
4.3.2 Possible Conflicts with Land Use Plans

None of the alternatives would conflict with federal, state, or local land use plans except for the BLM's Lahontan Resource Management Plan. This plan recognizes multiple uses, including mining, grazing, and recreation on the public lands proposed for withdrawal. The resource management plan that was developed by the Navy in consultation with the BLM, DOE, and BUREC for this proposed withdrawal action would amend the Lahontan Resource Management Plan. Once the new plan is approved, there will be no conflicts with land use plans.

The BUREC lands associated with the proposed withdrawal alternatives already have been withdrawn for the Newlands Project and cannot be used for other purposes that conflict with the purposes of the Newlands project. Multiple public uses would be allowed on Category B lands. Public access on Category A lands is restricted and would continue to be so under the action alternatives for public safety. Such restrictions were requested by the BLM.

4.3.3 Irreversible and Irretrievable Commitment of Resources

Public use, access, and development of Category A withdrawn lands would be closed because of off-range ordnance and HAZARD analysis concerns. Such restrictions would constitute a potentially irretrievable commitment of land and mineral resources. This commitment of resources can be reversed if the lands eventually are returned to the public domain or are managed under a less regulated program. This will require technology to detect and remove subsurface ordnance to acceptable levels. Such technology is not yet proven or cost-effective.



5.0 CUMULATIVE IMPACTS

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5. CUMULATIVE IMPACTS

5.1 OVERVIEW AND NEED FOR ANALYSIS

The CEQ regulations that govern the preparation of environmental impact statements provide that where federal actions would generate "cumulative impacts," those impacts should be considered in relevant EISs (40 CFR 1508.25 [1988]). The cumulative impacts analysis presented here is prepared in response to this regulatory requirement.

"Cumulative Impact" is defined as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time (40 CFR 1508.7 [1988]).

This analysis considers additional effects arising from the currently proposed NAS Fallon land withdrawal, together with effects of other known current and future actions in the region. These other actions could include existing, proposed, or reasonably foreseeable Department of Defense or other federal or nonfederal major actions. The only other actions identified in the region and included in the cumulative analysis are land withdrawals and airspace designations at NAS Fallon and the Hawthorne Army Depot (HWAD).

Other than the range safety and training land withdrawal discussed as the proposed action of this EIS, the Special Nevada Report (SAIC 1991) listed two foreseeable land withdrawals in Nevada-the Navy B-17/B-19 land bridge and B-18 range and the Army's Hawthorne Reserve Component Training Center (RCTC). Since the publication of the Special Nevada Report, the Navy's land bridge and B-18 withdrawals have been put on hold indefinitely due to changes in weaponry and the global military climate.

5.2 CUMULATIVE EFFECTS REGION

In order to analyze cumulative effects, a cumulative effects region must be identified. This area would be one in which effects of the NAS Fallon land withdrawal and other past, proposed, and reasonably foreseeable actions would be cumulatively recorded or experienced.

The primary cumulative effects region is comprised of Churchill County, Mineral County, and the Gabbs Valley area of Nye County, as shown in Figure 5-1. This region is defined for the analysis of the cumulative land surface effects of all existing and proposed land withdrawals. For certain resources, a smaller region of influence is used, as detailed in each resource category discussion. The cumulative effects of DOE and DOD military and defense-related uses on withdrawn lands in Nevada were analyzed in the Special Nevada Report, prepared pursuant to Section 6 of the Military Lands Withdrawal Act of 1986 (Public Law 99-606). Also pursuant to Public Law 99-606, NAS Fallon will prepare an EIS to evaluate the environmental effects of continued military use of Navy-withdrawn lands supporting training activities of NAS Fallon. The EIS, expected to be completed in 1998, will examine the cumulative effects of the continued withdrawal of land by NAS Fallon.

The secondary cumulative effects region comprises a larger area, which includes the region defined above and covers part of the counties of Pershing, Lander, Eureka, White Pine, Nye, Elko, and Esmeralda. This region is defined based on the collective footprint of existing, proposed, and reasonably foreseeable undertakings associated with NAS Fallon and Hawthorne Army Depot, formerly the Hawthorne Army Ammunition Plant (Figures 5-2 and 5-3). This region is identified and used mainly to evaluate the cumulative effects of airspace designations on public health and safety. The cumulative effects of DOE and DOD military and defense-related uses in airspace over Nevada also were analyzed in the Special Nevada Report.

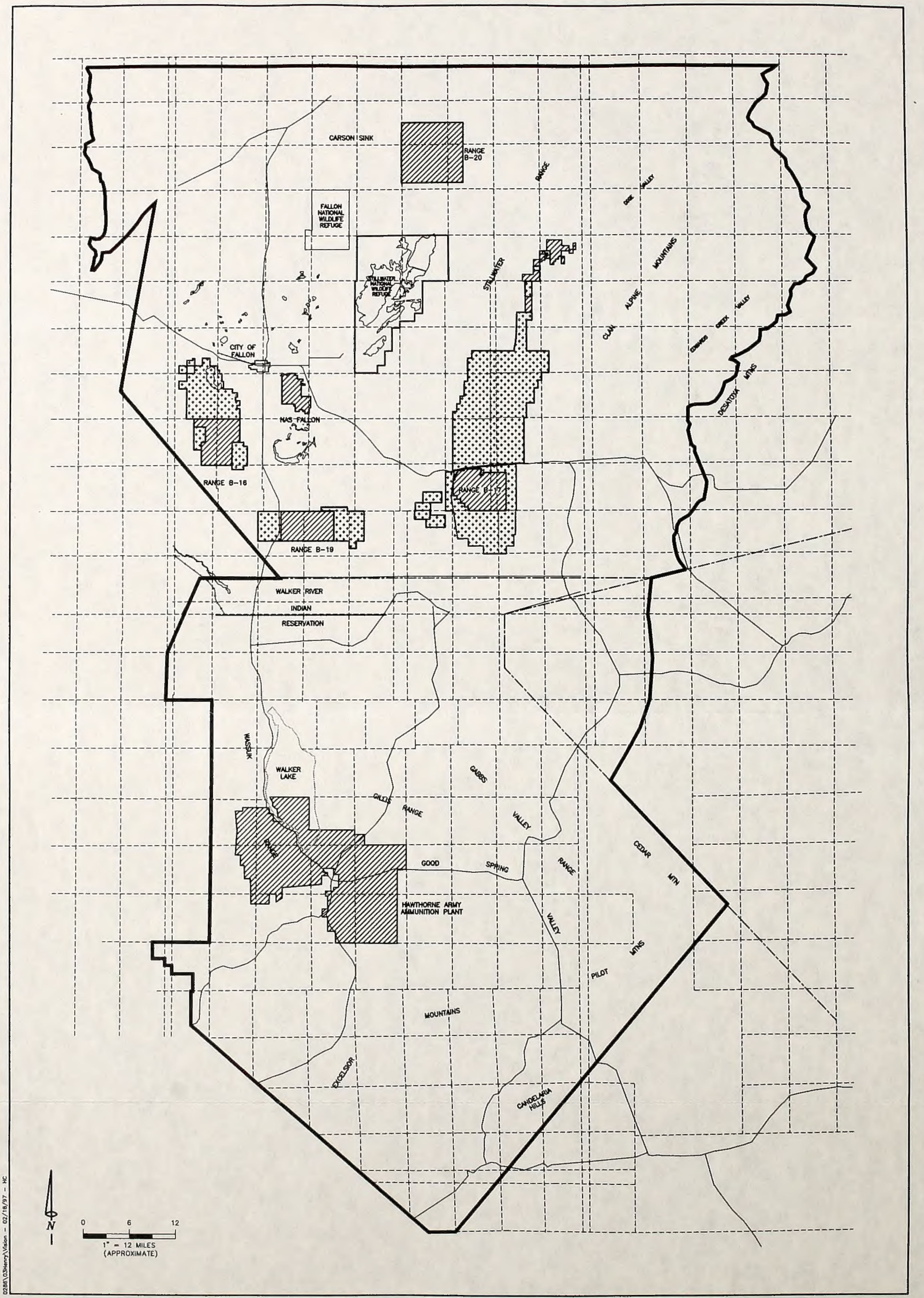
5.3 METHODOLOGY

This section describes the five-step methodology that was used to determine the magnitude of regionally significant cumulative effects arising from proposed military withdrawals.

Step 1: Determining the Regional Baseline. The first step in this cumulative effects analysis is establishing a regional baseline. By gathering data and analyzing trends, it is possible to make general conclusions concerning the natural environment, land use and socioeconomic conditions, and public health and safety conditions in the primary region.

In order to ensure that conclusions are valid, it is necessary to gather data that addresses a period of several years. The principal limitations in this regard are the availability of data and its reliability. Section 5.4 presents the regional baseline data.

Step 2: Determining the Effects of Existing Actions. The focus of a cumulative effects analysis is on the incremental effects of an action when added to other past, present, and reasonably foreseeable future actions. Accordingly, the second step in a cumulative effects analysis is the



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The proposed range safety and training public land withdrawal depicted here encompasses lands proposed for withdrawal under all alternatives, not the boundary for the preferred alternative.

LEGEND:

▨ Existing Owned or Withdrawn Military Lands

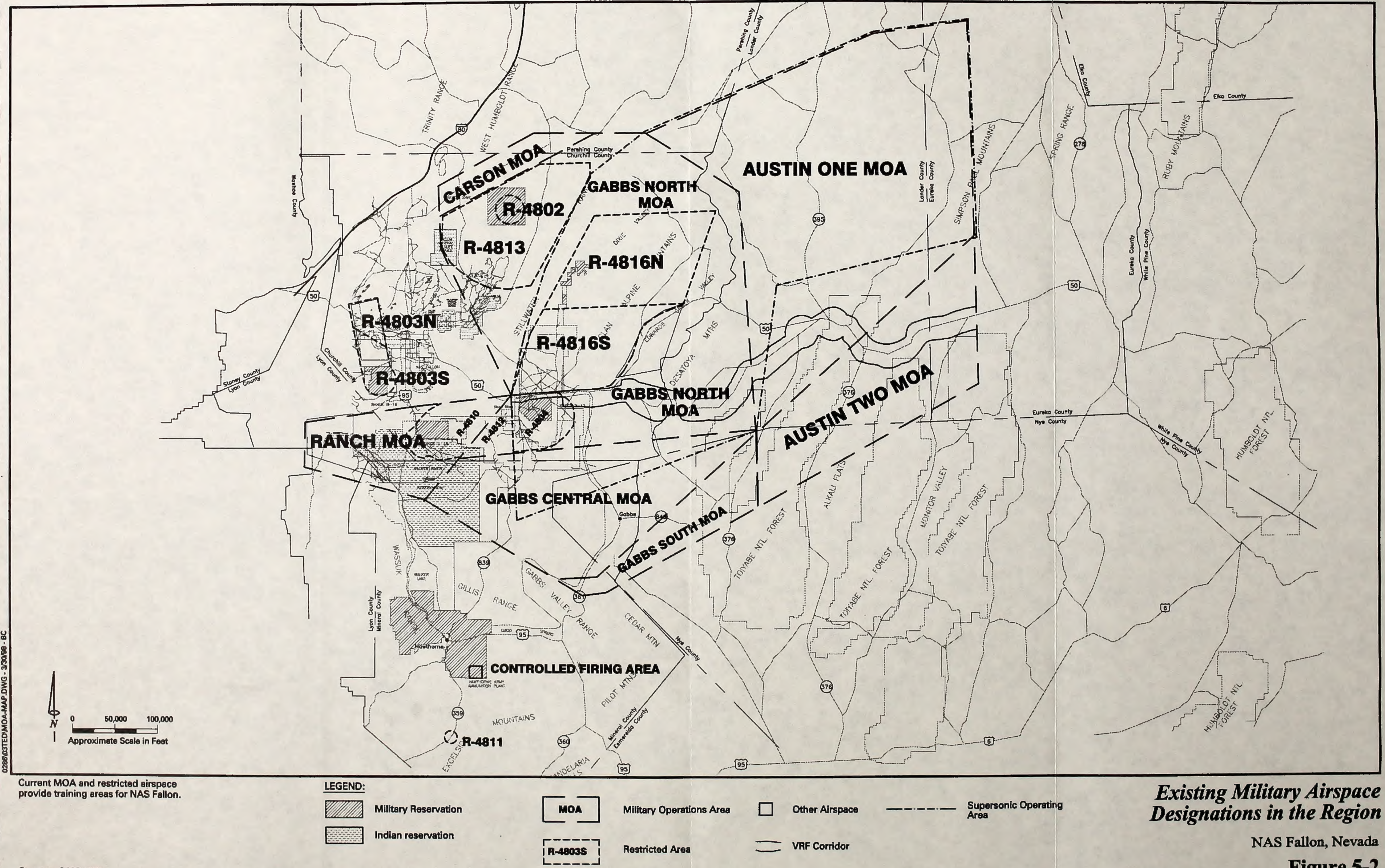
░ Proposed Range Safety & Training Public Land Withdrawal

Source: SAIC 1991

Existing and Proposed Military Land Withdrawals in the Region

NAS Fallon, Nevada

Figure 5-1



Current MOA and restricted airspace provide training areas for NAS Fallon.

Source: SAIC 1991

Existing Military Airspace Designations in the Region

NAS Fallon, Nevada

Figure 5-2

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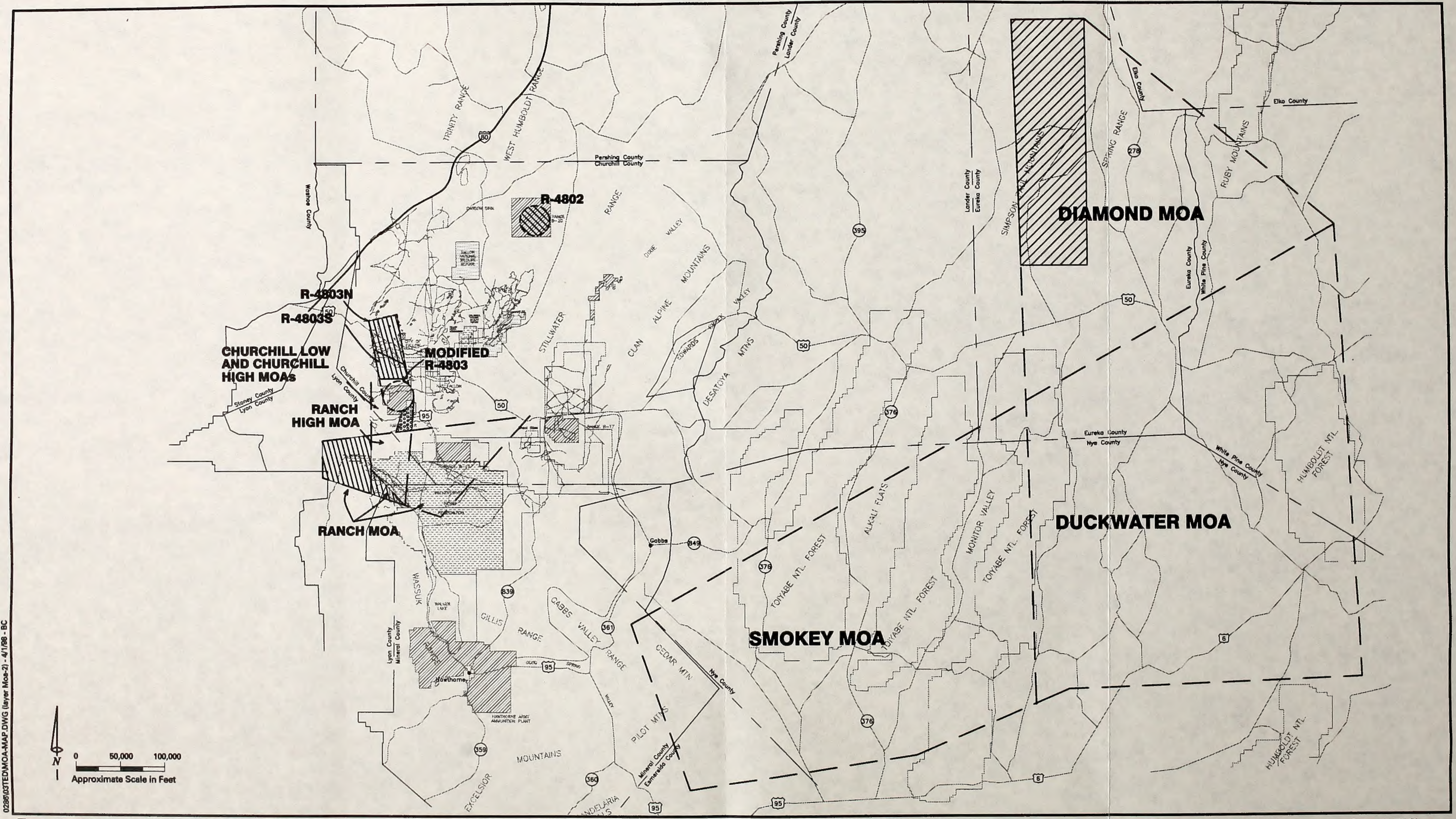

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The proposed airspace consolidation near B-16 is in the initial stages of the formal FAA review process.

Source: SAIC; Tetra Tech 1996

LEGEND:

- ▨ Military Reservation
- ░ Indian reservation
- MOA Military Operations Area
- R-4803S Restricted Area
- ▧ Area Proposed for Deletion
- ▒ Area Not Included in Churchill High MOA
- ▨ Area Authorized for Supersonic Activity as Identified in the Special Nevada Report - no longer proposed at this time.

Proposed and Reasonably Foreseeable Military Airspace Designations in the Region

NAS Fallon, Nevada

Figure 5-3

determination of the relevant effects of past and present actions. The discussion in Section 5.5 addresses the effects of existing withdrawals and airspace designations in the region.

Step 3: Determining the Effects of Proposed Actions. The proposed land withdrawal evaluated in this EIS, the proposed renewal of the B-20 land withdrawal, and the proposed airspace restructuring at B-16 are summarized in Section 5.6. Chapter 4 provides a detailed analysis of effects of the proposed land withdrawal to determine changes that may occur to the regional baseline conditions.

Step 4: Determining the Effects of Reasonably Foreseeable Actions. Cumulative effects could arise from the other foreseeable land withdrawals or airspace designations within the region. Although no new land withdrawals, in addition to the one proposed in this document, are foreseeable, Section 5.7 discusses effects from foreseeable changes in airspace.

Step 5: Determining Cumulative Effects. Once all potential effects have been identified, the final step in the cumulative effects analysis is to determine how those effects, when viewed together, could precipitate changes in the regional baseline conditions (Section 5.8). The essence of this process involves educated predictions and best available data of how the natural resources, land use and socioeconomic, transportation, and public health and safety aspects of the regional baseline conditions would be modified if one or more land withdrawals and airspace designations were implemented while existing withdrawals and air space designations remained in place.

5.4 REGIONAL BASELINE

Data regarding past and existing conditions were collected and analyzed in response to issues and concerns raised during the scoping process. Issues and concerns were grouped into eight major categories to encompass all topics of concern including water resources, biological resources, land use and socioeconomic conditions, visual resources, cultural resources, noise, public health and safety, and transportation. The existing conditions of these resources are described below.

5.4.1 Water Resources

Surface water resources in the region include the Lahontan, Sheckler, and Stillwater Point Reservoirs, Carson Lake and various playa lakes, springs, ponds, irrigation canals, and perennial streams. Surface water drains to closed basins, such as the Carson Sink, Dixie and Fairview Valleys, and Rawhide Flats. Springs vary in size from small seeps to substantial flows (BLM 1983).

Ground water availability and quality are variable. Salinity generally increases toward the centers of basins. In irrigated areas of the Lahontan Valley, agricultural irrigation has established shallow ground water aquifers and in some instances return irrigation flows may have reduced the water quality of the shallow ground water. Basin recharge typically occurs along the range fronts at the basin margins. Shallow ground water outside the saline central basins is generally suitable, at a minimum, for livestock and wildlife watering (BLM 1983; BLM 1984).

5.4.2 Biological Resources

The region supports a diversity of vegetation communities. The salt and alkali flats, shadscale, sagebrush, and pinyon-juniper woodland vegetation zones are typical of the Great Basin region. Small areas of riparian vegetation are found throughout the region, covering less than one percent of the total land area.

Over 300 wildlife species inhabit the region. These include mule deer, bighorn sheep, mountain lion, and upland game species, such as sage grouse, mountain quail, chukar, and mourning dove. A variety of waterfowl are found in wetlands in the region. Federally listed threatened and endangered species that may inhabit the region include the cui-ui, Lahontan cutthroat trout, bald eagle, and the American peregrine falcon. The region with its wetlands serves as an important nesting, resting, and foraging place for migratory birds.

5.4.3 Land Use

This section discusses the regional baseline conditions as they relate to land-based activities, including mining, grazing and recreation.

5.4.3.1 Mining

Information on the mineral resources of the region was derived from the Mineral Resource Inventory of Churchill County (Nevada Bureau of Mines and Geology 1987), Lahontan Resource Management Plan (BLM 1983; BLM 1985a; BLM 1985b), Walker Resource Management Plan (BLM 1984), and the 1990, 1992, 1995, and 1996 mineral resource evaluations performed for the proposed withdrawal area at NAS Fallon (US Bureau of Mines 1990; US Bureau of Mines 1992; US Bureau of Mines 1995; Thompson 1996).

There are 51 mining districts within the region. Metallic minerals, such as gold, silver, iron, tungsten, copper, lead, zinc, mercury, manganese, and antimony have been produced in the past from some of the mining districts. Gold, silver, and iron are of economic interest currently. Gold is mined in Fondaway Canyon in the Stillwater Range of Churchill County; at the Borealis project southwest of Hawthorne; at Rawhide Mine, about 23 miles northeast of Schurz; at Paradise Peak Mine, 15 miles southeast of Gabbs; at

Santa Fe Mine on Highway 361 between Gabbs and Luning; and at the "County Line" Project, south of Highway 361, on the Mineral/Nye County line. The Candelaria Project, southeast of Mina in Mineral County, is inactive. Exploration is active in the Stillwater Range area and in the area along Walker Lineament, north of Luning in Mineral County (BLM 1983; BLM 1984).

Nonmetallic minerals, such as clays, sand, gravel, diatomite, pumice, salt, limestone, graphite, magnetite, gem stones, gypsum, corundum, and other aluminous minerals have been produced in the region. Construction material, magnetite, and salt are currently of commercial value (BLM 1983; BLM 1984).

Of the energy resources of the region, geothermal resources are of greatest commercial significance. Dixie Valley contains several areas, especially in the northeast corner of Churchill County, with significant geothermal potential. Other important geothermal resource areas are Stillwater-Soda Lake to the north of Fallon and Desert Peak near the eastern boundary of Churchill County. Commercial production of electricity from geothermal resources commenced in most of these areas in the early 1980s, and there are five operating geothermal power plants in Churchill County. These include the Oxbow, Stillwater, Soda Springs, Brady Peak, and Desert Hot Spring geothermal plants. Geothermal heat is used for some manufacturing processes in the county. The geothermal resources of NAS Fallon also have been evaluated, and the Navy is moving forward with developing the resource for energy. Although geothermal resources of commercial significance have not been discovered in Mineral County and the Gabbs Valley area of Nye County, exploration continues. Public lands also are leased for oil and gas, but significant resources have not been discovered (SAIC 1991).

The contributions of mining to the regional economy are demonstrated by income and employment in the industry. Net proceeds from mining in Churchill County amounted to about $376,000 in 1988, and tax revenues from mining constituted about 0.4 percent of the county budget. About 1.7 percent of county employment was in mining in 1989. Net proceeds from mining in Mineral County were $1.4 million in 1988, and tax revenues from mining represented about two percent of the county budget (SAIC 1991). In 1992, almost 16 percent of the total employment in Mineral County was mining-related.

5.4.3.2 Grazing

Sources of data and information on grazing are the Walker Resource Management Plan (BLM 1984), Lahontan Resource Management Plan (BLM 1983; BLM 1985a; BLM 1985b), and Churchill County Master Plan (Churchill County 1990). Grazing historically has been one of the primary land uses in the region. There are 20 BLM grazing allotments, with a total area of approximately 2,204,000 acres, in Churchill County and Gabbs Valley. There are 17 BLM grazing allotments, with an approximate total area of 148,500 acres, in Mineral County. Prior to 1934, livestock grazing was controlled by individual claims to customary use of certain grazing areas. Grazing permits originally were awarded to previously established livestock operators, in accordance with the Taylor Grazing Act of 1934; this was followed in the early 1960s by an adjudication based on a range survey. Most of the livestock permittees are cattle operators. While most of the allotments are used for winter grazing, a few are used for year-round and summer grazing (BLM 1983; BLM 1984).

5.4.3.3 Recreation

Major forms of recreation in Churchill County are hunting, fishing, horseback riding, cultural resource interpretive sightseeing, and off-road vehicle use. Figure 3-12 presents important recreation areas in the region. Hunting occurs primarily in the mountainous areas during the fall season. Most of these hunting areas are in the Stillwater, Clan Alpine, and Desatoya mountain ranges. Hunting focuses primarily on mule deer, game birds (such as chukar), and small game species. Waterfowl hunting is important in the Stillwater Marsh. Sheckler Reservoir near Fallon also is used for recreation. Off-road vehicle use occurs at Sand Mountain Recreation Area, which was visited by 29,640 persons in 1989 (BLM 1989a).

The Grimes Point and Hidden Cave archaeological sites are important for cultural resource interpretative sightseeing as sites of historic and archaeological significance. About 24,000 persons visit these sites annually (BLM 1997). Other sites of historic significance include the Cold Springs and Sand Springs Pony Express stations. Additional recreational activities include rock hounding, horseback riding, fishing, hiking, camping, and photography. Much of this recreation use occurs in the "backcountry," within or near the wilderness study areas, which include Job Peak, Clan Alpine, Desatoya, and Stillwater (BLM 1985a; BLM 1985b). Of the three state parks in Churchill County, Lahontan State Park attracts the greatest number of visitors; about 274,500 visitors were recorded in 1989 (BLM 1989b).

Recreation resources of Mineral County and the Gabbs Valley of Nye County are similar to those of Churchill County. Areas important for hunting are within the Gabbs Valley Range, Bodie-Aurora area, Wassuk Range, Gillis Mountain, Pilot Range, Candelaria Hills, Excelsior Range, and the Cedar Hills. Species hunted include mule deer, upland game birds, and small game species. While no particular area has been designated for ORV use in Mineral County, areas currently used include Mason Valley, Wilson Canyon, and Carson Valley ORV corridors. Walker Lake State Park and the land along the lake managed by the BLM are popular for camping and other recreation. In 1988, this area attracted over 110,000 visitors (BLM 1990).

5.4.4 Socioeconomics

In 1980, Churchill County had a total population of 13,917, representing a population growth of 32 percent between 1970 and 1980. By 1990, the total population was 17,938 (US Bureau of the Census 1990). While there is some population dispersed in the Stillwater area, Edwards Creek Valley, Hazen, and Middlegate, the bulk of the county's population historically has been and currently is concentrated in the county seat at Fallon, which by 1990 had a population of 6,438 persons.

The Gabbs Valley area (Gabbs Division) of Nye County contained a population of about 812 in 1990 (US Bureau of the Census 1990). This population is concentrated in the Town of Gabbs (population, 667), where the primary economic pursuits are mining and minerals processing.

The population in Mineral County declined between 1970 and 1986, and only a small increase was recorded in 1987. By 1990, the county had a population of 6,475 (US Bureau of the Census 1990). Most of the residents of Mineral County are concentrated in the Towns of Hawthorne (population, 4,162), Luning, Mina, Montgomery Pass, and Schurz.

From the point of view of income (earnings by place of work), government is the leading economic sector in Churchill County. The economic base of the Gabbs area in Nye County is provided by mining. In Mineral County, services constitute the single most important sector in terms of income and employment, followed by mining, construction, and state and local government. Federal government income produces about 30 percent of all government income in the county. A small tourism industry also exists due to the attraction of Walker Lake and gaming opportunities in the county.

As noted above, federal government operations in Churchill and Mineral counties contribute a significant portion of the regional income and employment. Additionally, these operations provide support to a large service sector in the region through local spending by the federal government and local spending of payroll income by federal government employees. The HWAD contracts out most of its operations, resulting in the development of a large service sector in Mineral County. Similarly, the economy of the City of Fallon is in large part based on the services provided to NAS Fallon.

In 1996, the assessed value of airspace used by commercial airlines in Nevada was $140 million. The assessed values of airspace in Churchill, Lander, Eureka, and Nye Counties were $3.3 million, $3.1 million, $1.6 million, and $14.6 million, respectively (Nevada 1996).

5.4.5 Visual Resources

Information on visual resources is derived from the Lahontan Resource Management Plan (BLM 1983; BLM 1985a; BLM 1985b) and the Walker Resource Management Plan (BLM 1984).

Scenic qualities of the region are characteristic of the basin and range area of the western United States. Some areas in the region are highly regarded for their scenic quality. The Stillwater, Clan Alpine, and Desatoya mountain ranges, Sand Mountain, Carson River, Wassuk Range, and Gabbs Valley Range ranked as above-average, or "Class B," scenery, according to the BLM Visual Resource Management Classification. The southern portion of the Desatoya Range and Deep Canyon in Clan Alpine Mountains would be considered "Class A," or outstanding scenery. The remainder of the region would rank as common scenery. Cultural modifications in the region include roads, fences, and utility corridors.

5.4.6 Cultural Resources

Prehistoric, historic, architectural, and Native American traditional use sites are known to exist throughout the project region. Prehistoric sites include lithic scatters, rock shelters, petroglyph and pictograph sites, rock alignments, and caves. Historic sites include the remnants of 19th century mining communities, portions of the original Pony Express National Historic Trail and early 19th century exploration and emigrant trails, overland stage stations, telegraph and trade routes, and other evidence of early settlement. Recorded historic and prehistoric sites number into the low thousands within the region. Grimes Point and Hidden Cave archeological sites are tourist attractions, as are numerous "ghost towns" in the area. Only a very small percentage of the region, however, has been surveyed for cultural resources (BLM 1983; BLM 1984). Areas of traditional Native American use are even less well-defined.

5.4.7 Noise

Ambient noise levels in the region vary widely. A large portion of the region within NAS Fallon-associated airspace records elevated noise levels between 75 Ldn near the station boundary and 60 Ldn in adjacent areas of Fallon, resulting mainly from aircraft overflights. Noise levels also are elevated in and around the training ranges from 60 Ldn outside the ranges to over 75 Ldn inside the ranges and along aircraft flight patterns, as a result of gunnery, bombing, and aircraft noise (SAIC 1991; US Navy 1995f).

Elevated noise levels (above 65 Ldn) in and around HWAD occur from use of the Controlled Firing area, from the demolition of ordnance and ammunition at Restricted Area R-4811, and from the use of the small arms range. Aircraft noise is not recorded, as aircraft use is not associated with HWAD.

Noise levels in the rest of the region are generally lower because of the sparse distribution of population and the limited amounts of traffic and other noise-generating activities.

5.4.8 Public Health and Safety

Public health and safety conditions vary in the region. Parts of the region subject to NAS Fallon aircraft overflights are affected by noise, as discussed in Section 5.4.7 above. These areas are also at a small risk of impacts from objects inadvertently dropped by aircraft. In and adjacent to the training ranges, public safety is affected by ordnance delivery. Ordnance-contaminated lands outside the ranges are closed to the public. When receiving air traffic control advisory services there exists only a small risk to general aviation because aircraft are separated by air traffic control. Public health and safety conditions around HWAD are affected mainly by noise generated by ordnance demolition. Civilian aircraft could be damaged if they enter the restricted area when ordnance is being demolished.

5.4.9 Transportation

The region is served by US Route 50, an east-west highway that links the region to other parts of the state and California. The chief north-south route through the region is US Route 95. Other important routes are Nevada Routes 361 and 376.

5.4.10 Airspace Designation and Use

The airspace over the region is used by both military and civilian aircraft. Civilian aircraft use the visual flight rules (VFRs) corridor, which is aligned over Route 50 and allows civilian aircraft to travel through the NAS Fallon complex (see Figure 5-2). Other airways are established in the region for civilian aircraft use. Major commercial airways also exist over Nevada.

5.5 EXISTING MILITARY LAND WITHDRAWALS AND AIRSPACE DESIGNATIONS AND EFFECTS

This discussion presents a summary of all existing military land withdrawals in the region in terms of their functions, use, and regional effects. As noted above, lands in the region have been withdrawn by the military for locating facilities and for air and surface training and bombing areas. Figures 5-1 and 5-3 present the location of all existing land withdrawals and airspace designations in the region. Table 5-1 provides data on the size of each existing and proposed withdrawal or military facility. Table 5-2 presents data on the size of each existing airspace designation. Tables 5-1 and 5-2 also contain information on proposed and reasonably foreseeable actions to present an overview of all potential actions.

TABLE 5-1
EXISTING AND PROPOSED REGIONAL MILITARY LAND WITHDRAWALS

Withdrawal	Area (Acres)
Existing Land Withdrawals	
NAS Fallon Air Station	4,627[1]
FRTC	77,589
Bravo 16	17,280
Bravo 17	21,400
Bravo 19	17,332
Bravo 20	21,577[2]
Hawthorne Army Ammunition Plant	147,431
	229,647 (4.0%)[3]
Proposed NAS Fallon Range Safety and Training Land Withdrawal *(Total withdrawal area—not the Preferred Alternative area)*	
FRTC	195,180 (3.4%)[4]
Bravo-16	34,025
Bravo-17	35,895
Bravo-19	19,080
Dixie Valley Area	98,775
Shoal Site	7,405
Total Withdrawn Area	424,827 (7.3%)
Total Area of the Region[5]	5,796,481 (100%)

Source: SAIC 1991, Tetra Tech 1996

[1] An additional 3,934 acres are held in fee simple.

[2] An additional 19,430 acres are held in fee simple.

[3] Figures in parentheses are lands withdrawn or under consideration for withdrawal as percentage of total land in the study area.

[4] This represents the total land area evaluated for withdrawal, not the preferred withdrawal footprint of approximately 127,365 acres; no alternative in the EIS proposes to withdraw this amount of land.

[5] Includes Churchill County, Mineral County, and the Gabbs Valley in Nye County.

5.5.1 Existing Military Facilities, Land Withdrawals, and Airspace Designations

Existing facilities and designated airspace include NAS Fallon, the FRTC, the Dixie Valley area and shoal site, and the HWAD and its associated airspace.

5.5.1.1 *Existing Military Facilities and Land Withdrawals*

NAS Fallon Facilities and Land Withdrawals

NAS Fallon, established in 1942 during the early stages of World War II, originally was an Army Corps training post. The Navy began using the facility in 1943 as a training and support station for air groups on training missions. The station encompassed 7,982 acres, including other lands controlled by NAS Fallon, such as the electronic warfare emitter sites, easements, and rights-of-way. These are not within the range or station boundaries but are dispersed throughout the region. Of this acreage, 3,527 acres are withdrawn under PLO 275, 788, and 2635. About 2,934 acres are acquired lands held in fee simple and are water-righted, and approximately 1,000 acres are acquired lands held in fee simple but are not water-righted. In April 1991, 400 acres of land adjacent to NAS Fallon were withdrawn for Navy housing and a safety arc by PLO 6834. This brought the total acreage of the station to 8,382 acres, of which 3,927 acres are withdrawn.

Since 1980, approximately 70 EW and TACTS sites have been constructed. The total amount of public land affected, including access roads, utility corridors, and site location, is about 565 acres. These lands are dispersed throughout the 4.2 million acres administered by the BLM Carson City District. All sites were developed under BLM rights-of-way with BLM coordination and review of Navy environmental documentation. These sites are critical to the NAS Fallon training mission.

The FRTC

The FRTC includes training ranges B-16, B-17, B-19, B-20, TACTS, the Dixie Valley area, and associated special use airspace. The locations, dimensions, facilities, and use of these areas are described in Chapter 2.

Under the National Emergency War Powers Act, the NAS Fallon training range was created in April of 1944 with the temporary establishment of B-20. B-17 and B-19 were established by use permit in 1945. NAS Fallon was deactivated to a maintenance level after World War II but was reopened in 1951. In 1953, jurisdiction of B-16, B-17, and B-19 was officially transferred to the Navy by congressional legislation. A fourth range, B-20, also was requested, but the Navy withdrew the request and obtained the use of the range through lease arrangements.

In 1958, the Navy used temporary withdrawals to establish the Black Rock and Sahwave ranges. These lands were returned to the BLM in 1965. In 1974, the BLM asked the Navy to obtain a congressional withdrawal for the use of B-20. The withdrawal of federal lands within B-20 (21,577 acres) was completed in 1986 through the enactment of PL 99-606.

In addition to these lands currently withdrawn for military use, there are two other areas in the region where military use historically has occurred under special use permits. The first of these is the central portion of the shoal site, a 2,560-acre area withdrawn by the Atomic Energy Commission (now DOE) in the 1950s. The entire shoal site has been used by the Navy since 1965 for helicopter search and rescue training. The second area is the Dixie Valley area, which has been used by the Navy under a special land use permit since 1966. The land use permit has since expired, and individual equipment sites are now authorized by the BLM through the use of ROWs.

HWAD Facilities and Land Withdrawals

The first military facility in the region, established in 1928, was the Hawthorne Naval Ammunition Depot near Hawthorne in Mineral County. The lands selected for the depot consisted mainly of public domain lands administered by the federal government. These lands were withdrawn for the depot under a presidential executive order. From 1928 to 1977 the depot was owned by the Navy. After 1977 it was transferred to the Army to centralize all ammunition functions under one service. In 1980, the depot was converted to a government-owned contractor-operated facility. HWAD serves as an ammunition depot and as a facility to produce, assemble, test, and demilitarize munitions. It also provides tenant support to the US Army Information Systems, Naval Undersea Warfare Engineering Station, and Nevada National Guard (US Army 1990).

5.5.1.2 Existing Military Airspace Designations

NAS Fallon Airspace

Figure 5-2 presents military airspace associated with NAS Fallon. This includes nine restricted areas, seven military operations areas, five air traffic control assigned airspace areas (ATCAAs), one aerial refueling route (AR), and several MTRs. Hereinafter, these designations are collectively referred to as NAS Fallon Airspace. Table 5-2 includes the approximate size of the various airspace designations.

Restricted Areas. Restricted areas are located above and extend beyond the boundaries of NAS Fallon training ranges or target areas. Table 5-3 presents information on these restricted areas. Civil aircraft can fly in these areas when they are not being used for military training activities.

Military Operations Areas (MOAs). MOAs are used for military training activities that do not involve the release of ordnance, such as air combat maneuvers, air intercepts, and aerobatics. Civil aircraft can use all the airspace in MOAs anytime, including when military use is in progress. In 1958, for

TABLE 5-2
EXISTING, PROPOSED, AND REASONABLY FORESEEABLE REGIONAL MILITARY AIRSPACE DESIGNATIONS

Airspace Designation	Approximate Size (square miles)
Existing Military Airspace Designations	
NAS Fallon	
Restricted Areas	958
MOAs	10,387
HWAD	
Controlled Firing Area SUA	14
Restricted Area (R-4811)	9
Proposed Airspace Designations	
Disestablish R-4803N	-46
Restructure R-4803S	-71
Restructure Ranch MOA	-104
Create Churchill Low MOA	109
Note: A modified Restricted Area R-4803, Churchill High MOA, and Ranch High MOA also are proposed but will be located above existing and proposed designated airspace, thereby not affecting the square miles of ground covered.	
Reasonably Foreseeable Military Air Space Designations	
Diamond MOA	2,085
Duckwater MOA	4,818
Smokey MOA	3,853
TOTAL	22,012

Source: SAIC 1991, Tetra Tech 1996

reasons of enhancing flight safety, a VFR corridor was created specifically for general aviation needs within the FRTC special use area. General aviation aircraft flying by instrument flight rules (IFR) also can use the airspace but in practice are routed around MOAs or can be separated from military activities occurring in MOAs by air traffic control. The existing MOAs around NAS Fallon are depicted in Figure 5-2. The sizes are reported in Table 5-4.

Air Traffic Control Assigned Airspace Areas. ATCAAs are airspace of defined vertical/lateral limits, assigned by the air traffic controller for purposes of providing air traffic separation between the specific military activities being conducted within the assigned airspace and other IFR traffic. These areas normally are established at 18,000 feet MSL and above and usually are placed above a MOA.

Other Military Airspace Designations. One AR is associated with NAS Fallon. Civil aircraft can use the airspace within the AR while refueling operations are underway. MTRs are "flight paths," usually established below 10,000 feet MSL, for low altitude navigation and terrain-following training at speeds in excess of 250 knots. MTRs may be designated IFR, operated in accordance with instrument flight rules, or VFR, operated in accordance with visual flight rules.

TABLE 5-3
EXISTING RESTRICTED AREAS

Restricted Areas	Associated Range	Approximate area (in square miles)
FRTC		
R-4802	B-20	28
R-4803N & S	B-16	113
R-4804	B-17	120
R-4810	B-19	120
R-4813	B-20	531
R-4812	B-17 & B-19	174
R-4816N & S	None	872
	TOTAL	1,958
HWAD		
R-4811	Not Applicable	9.3

Source: SAIC 1991

TABLE 5-4
EXISTING MOAs IN THE REGION

MOA	Approximate Area (in square miles)
Carson	171
Gabbs North	3,644
Gabbs South & Gabbs Central	1,634
Ranch	564
Austin 1	3,238
Austin 2	1,136
TOTAL	10,387

Source: SAIC 1991

Recent MTR Revisions. The Navy recently altered 12 MTRs associated with B-16 that terminate in R-4803 N/S. The change altered the terminal legs of six VFRs and one IFR. It also deleted the terminal legs of four VFRs. All affected routes now terminate with entry into B-20. The action reduces low-level military air traffic into B-16, thereby reducing noise levels (US Navy 1995d).

HWAD Airspace

Figure 5-2 presents existing military airspace designations associated with HWAD. These are the Controlled Firing Area and R-4811, both described below.

Controlled Firing Area Special Use Airspace. Aircraft transit through this airspace is not restricted. During firing, a ground-based observer watches for overflying aircraft. If aircraft is spotted, all gunfire must be terminated until the aircraft departs the controlled firing area.

Restricted Area R-4811. This area is located 25 miles south of HWAD. This cylindrical airspace, 1.5 nautical miles in radius, is restricted from surface to 15,000 feet AGL because fragments from detonations at surface can rise up to 15,000 feet. The airspace is not used for military flying activity.

5.5.2 Effects of Existing Land Withdrawals and Airspace Designations

The following sections summarize the effects of existing land withdrawals and airspace designations on the eight resource areas of concern.

5.5.2.1 Water Resources

The effects of the existing withdrawals on perennial streams and springs in the region are not known or expected to occur. It is likely that land disturbing activities on the withdrawn lands may have caused an increase in sedimentation in some of the surface water resources. There is no indication that significant impacts to surface water resources have occurred as a result of land withdrawals. There are water rights for 114 acre-feet per year (AFY) of ground water and 18 AFY of surface water in Rawhide Flats hydrological basin affected by B-19. The Navy does not hold these water rights (SAIC 1991). No significant impacts to surface water have occurred as a result of the withdrawal at B-19. The Navy holds water rights to 10,269 AFY of surface water in the Newland's Reclamation Project and to 2,298 AFY of ground water in Carson Desert. In addition, the Navy owns 3,168 acres of water-righted land in the Dixie Valley. Only a part of the surface water allocated to the Navy is used, and NAS Fallon actions have not resulted in a lowering of the area water table and have not exceeded existing water rights. The use of airspace associated with NAS Fallon has had no known effects on water resources (SAIC 1991).

HWAD has water rights to 399 AFY of ground water and 7,529 AFY of surface water, which represents about 15 percent of water rights in the Walker Lake and Whiskey Flats area. The HWAD boundaries also affect areas in the Wassuk Range with privately held water rights of 164 AFY. The Mt. Grant watershed, a source of high quality water, has been removed from public access by HWAD. This action has had no known effect on water resources. The use of airspace associated with HWAD has had no known effects on water resources (SAIC 1991).

5.5.2.2 Biological Resources

NAS Fallon is in an area that supports greasewood communities typical of alkali flats in the region as well as shadscale, sagebrush, and pinyon-juniper communities. Direct and indirect effects on wildlife and its habitat have occurred from the establishment of the station and FRTC facilities. Although some of the original vegetation in the area of the air station has been removed, several of the training range areas and the Dixie Valley area support large areas of native vegetation (SAIC 1991).

The land located under the FRTC airspace contains wetlands important to migrating birds and many other animals. In 1989, NDOW monitored the effects of military air operations at NAS Fallon on wildlife inhabiting the region. The study recorded that most animal and bird species, including sensitive species in the area, were subjected to startle effects from aircraft noise but that the reproduction process apparently was not affected (NDOW 1989). Other studies on the effects of aircraft overflight on wildlife found that aircraft overflight does not affect the numbers or diversity of animals, does not cause a change in daily activity patterns, does not result in a cumulative increase in energy cost, and does not affect reproductive success (Krausman 1993a, b, c; Workman et al. 1992; Ellis et al. 1991; Anderson 1989; Manci et al. 1987). NAS Fallon has tried to reduce impacts to wildlife by avoiding overflight of the Stillwater area and Carson Lake below 3,000 feet AGL whenever tactically feasible. In addition, in-flight releases of fuel are performed in specified locations, and fuel is released only above 6,000 feet AGL where it evaporates before contact with the ground (SAIC 1991). As discussed in Section 4.2.3.1, the consumption of chaff by wildlife has not been shown to be biologically significant (SEA 1989; Naval Research Laboratory, 1995).

Portions of the land area on HWAD have been affected by construction and explosive ordnance. Habitat destruction, water pollution, and increased noise levels may have resulted from HWAD operations (SAIC 1991). Although the effects of these activities at HWAD have not been evaluated, there has been no indication of significant impacts to biological resources.

5.5.2.3 Land Use

The following sections describe the effects of existing military land withdrawals and airspace designations on land use in the region.

Mining. The existing land withdrawals have removed land from mining availability. Although no significant mineral deposits are known to underlie NAS Fallon or the shoal site, some mineral deposits may underlie B-16, B-17, B-19, and the Dixie Valley area (Figures 3-8 and 3-9). Portions of four mining districts fall within or extend into the training ranges. These are the Camp Gregory District, which is covered in part by B-16; the Fairview District, which is affected by B-17; and the Cinnabar Hill mining area and Holy Cross District, which are affected by B-19. There is moderate to high potential for the development of one or more small- to medium-sized silver and gold deposits in the northeastern part of B-17. The area extending from Cinnabar Hill through the northeastern portion of B-19 has high potential for discovery and development of precious metal deposits (SAIC 1991).

Churchill County has extensive geothermal resources. Significant geothermal resources have been discovered in Dixie Valley, primarily outside the proposed withdrawal area. Given the distribution of these resources, it is considered likely that the existing land withdrawals could be underlain by geothermal resources with moderate to high development potential. B-19 is considered to have better than average geothermal potential. Exploration that has taken place around Fallon indicates that the geothermal resources of NAS Fallon lands would be capable of supporting development of a geothermal powerplant. The Navy is examining the possibility of developing geothermal resources at NAS Fallon to generate power and for heating purposes, and has initiated the environmental review process for this proposal. Based on the geology and the results of exploration in the region, oil and gas potential is considered to be low for all lands that are currently withdrawn (SAIC 1991).

The existing HWAD withdrawn lands also have removed some land from mining. Portions of three mining districts, Lucky Boy, Mt. Grant,. and Pamlico, overlap with the withdrawn lands. A small part of the Lucky Boy District extends into the HWAD. Silver and lead are the minerals associated with this district, but the area of the district under HWAD is assessed as having low potential for these minerals. A large part of the Mt. Grant District falls under HWAD lands. This area is assessed as having low to moderate development potential for gold and a low to moderate potential for molybdenum deposits. The area of the Pamlico District under HWAD has a low to moderate potential for gold deposits (SAIC 1991). Given that exploration and development of minerals is not permitted on HWAD lands, the withdrawal has reduced the opportunities for mineral development in the region. However, the affected areas have only low to moderate mineral potential. A known geothermal resource area extends under HWAD lands in the southern Walker Lake basin, and there is some potential for geothermal development, based on this resource within HWAD. The potential for oil and gas resources in the withdrawn lands is considered to be low, based on the geology and explorations conducted in the area. Geothermal resources under HWAD as yet have not been examined for generating electricity.

The airspace designations associated with NAS Fallon and HWAD have not had any known effects on mining.

Grazing. Existing land withdrawals in Churchill County have taken land out of potential grazing and livestock production. Given the topography, climate, and vegetation in the region and the prevalence of ranching and grazing around the withdrawn lands, it is likely that these lands were under grazing prior to their withdrawal. Agricultural outleases are issued each year for approximately 3,000 acres of Navy land on-station and approximately 9,000 acres in the Dixie Valley area. These lands are water-righted and held in fee simple. Livestock and feed production are the chief uses of the land leased to the public. As discussed in Section 4.2.11, chaff would not adversely affect livestock. Studies have shown that since chaff passes through the digestive system of cattle with only insignificant amounts being retained in the body, consumption of chaff has no significant adverse effect on the animals or on products used by humans (SEA 1989; Naval Research Laboratory 1995).

Existing land withdrawals at HWAD also have removed lands from grazing and agricultural production. HWAD lands are not leased out for grazing, though grazing likely would have been the major land use if the lands had not been withdrawn.

Recreation. NAS Fallon is situated in an agricultural valley. It is likely that the withdrawn lands had only a low recreation potential relative to other areas of Churchill County. Accordingly, the land withdrawal for the station probably did not affect recreational resources of the region significantly. Because wilderness regions were defined after the withdrawals were enacted, none of the current WSAs are affected. A variety of outdoor recreation could occur on the existing FRTC withdrawn lands if these were accessible to the public. It is likely that the FRTC withdrawals have reduced the amount of land available for hunting, especially for upland game.

Recreation in the region also has been affected by the use of airspace associated with NAS Fallon. A survey of recreationists, conducted in the vicinity of NAS Fallon, indicated that about 20 percent were so affected by aircraft disturbance that they would be reluctant to return to the region for recreation. MOAs extend over the WSAs and established recreation facilities. A MOU between the Navy, Department of the Interior, and the State of Nevada concerning use of airspace by NAS Fallon requires that the aircraft operate at a minimum altitude of 3,000 feet AGL over Clan Alpine and Desatoya WSAs, Stillwater, and Carson Lake, where tactically feasible. While these measures have combined to minimize potential impacts on recreation, nonetheless some type of recreational opportunity is affected by aircraft activity in the region.

The lands withdrawn at HWAD include a part of the Wassuk Range. Although use of this area for hunting, fishing, and sightseeing is permitted by HWAD, overnight use is not permitted. In addition, the general association of the lands with HWAD may have resulted in a lower use of these areas compared to other similar areas (SAIC 1991). Thus, the HWAD designation has resulted in some restriction of recreational opportunities. Airspace associated with HWAD is not used by aircraft; therefore, recreational impacts from airspace use do not occur.

5.5.2.4 Socioeconomics

NAS Fallon received a change in designation from a naval auxiliary air station to naval air station in 1972. This redesignation was responsible for a significant increase in the population of Churchill County from 1970 to 1980. In 1994, there were 2,330 jobs directly and indirectly associated with NAS Fallon, including contract employees. Therefore, NAS Fallon employs about 30 percent of Churchill County's residents. Although NAS Fallon and FRTC withdrawals have reduced the area available for grazing and livestock production, mining production, and recreation in the region, the economic losses due to the land withdrawals are offset by income and employment benefits generated by the station.

In 1988, about 850 personnel were employed at HWAD, constituting about 24 percent of all workers in Mineral County. In addition, the local spending of these employees supports jobs in local businesses. As a contractor-operated facility, most of the plant operations are contracted out; therefore, a large service sector has developed. Employment indirectly supported by HWAD formed about eight percent of the total employment in the county in 1988. If the withdrawn lands had been used for grazing and mining land uses, the employment benefits from those uses likely would have been much smaller than the employment benefits from the military use of the lands.

5.5.2.5 Visual Resources

The establishment of NAS Fallon has not significantly affected the visual resources in the region because the station is located in an agricultural valley where some settlement had already occurred prior to the construction of the station. The training ranges have resulted in land-disturbing activities and the construction of structures in areas that formerly were rugged undisturbed terrain. However, as these lands are not open to the public, most of these areas are not viewed by a large number of people, although travelers along regional roads and highways may be subjected to some disturbed landscape. Land-disturbing activities on HWAD have affected the visual resources in some parts of the withdrawn lands. The airspace designations associated with NAS Fallon and HWAD have had no effects on visual resources.

During surveys for chaff on a portion of the Dixie Valley area in 1994 and 1995, evidence of chaff activity was found within the boundaries of the wilderness study area, which may affect the visual quality of this area because wilderness areas are meant to show no effects from human presence. However, due to the generally wide dispersion patterns, visual effects from chaff are expected to be minimal.

5.5.2.6 Cultural Resources

The construction of NAS Fallon took place before the enactment of the National Historic Preservation Act. At that time, no requirement existed for identifying and evaluating cultural resources prior to construction. Cultural resource surveys have been performed for specific development proposals subsequent to enactment of the NHPA. The surveys have indicated the existence of more than 100 cultural resource sites at the station. Numerous sites have been recorded on B-17 and B-19, although only limited areas have been subjected to archaeological survey. A small section of B-20 has been surveyed.

No recorded sites are located on the EW military developments, and no sites were recorded in a survey conducted on the shoal site. A CRMP and programmatic agreement have been prepared for NAS Fallon landholdings (US Navy 1993a), and this document sets forth a plan for identifying, evaluating, and managing NAS Fallon cultural resources, consistent with Section 106 of the NRHP. Airspace use in the FRTC has a limited potential to affect cultural resources (SAIC 1991).

Although archaeological surveys were not conducted prior to the establishment of HWAD, it is likely that a number of sites were affected by the original construction. Approximately 1.6 percent of the HWAD withdrawal has been surveyed during 14 cultural resources surveys. Record searches have indicated that 85 prehistoric and 15 historic sites have been recorded in the HWAD, including a number of structures that have been found to be eligible to the National Register of Historic Places. While the significance and integrity of most of the recorded sites is not known, some sites are known to have been partially or completely destroyed. Six sites have been recorded on Restricted Area R-4811, some of which have been affected by the military use of the area (SAIC 1991).

5.5.2.7 Noise

The primary source of noise associated with NAS Fallon is from sortie take-offs and landings. Noise was evaluated at all of the FRTC training ranges in the 1982 RAICUZ study (US Navy 1982b) and was updated at the air station and B-16 in a 1995 Noise Study (US Navy 1995f). The 1995 study, which plotted Ldn contours at B-16, found that residential developments near the Sheckler Reservoir are outside the 60 dB Ldn contours. Other non-Navy noise sensitive areas in the county, such as the Stillwater Wildlife Management Area, Fallon National Wildlife Refuge, and Stillwater National Wildlife Refuge, are not affected by Navy operations at B-16 (US Navy 1995f).

Airspace use of Restricted Areas, MOAs, and MTRs associated with the FRTC has resulted in significant noise effects in the region. The Special Nevada Report reported that the 65 and 75 dB contours over B-16 extended in a general north-south direction from B-16 up to Highway 50 to the west of the City of Fallon (i.e., some of the western section of the city received noise effects from this airspace use).

Aircraft using restricted areas of the remaining FRTC ranges (B-17, B-19, B-20), the Dixie Valley area, and MOAs and MTRs also produce noise; however, the number of sensitive receptors in these areas is insignificant, and effects are therefore relatively insignificant (SAIC 1991).

Supersonic aircraft operations also are conducted in the NAS Fallon airspace, within certain parts of the Gabbs North and Central and Austin One MOAs. It is estimated that about 310 persons reside under this airspace. Sonic booms occur at random throughout the area and in 1989 occurred at an average overpressure that was sufficient to startle some humans and animals (SAIC 1991). Studies conducted by the State of Nevada have determined that sonic booms do not adversely affect wildlife (NDOW 1989) or human health (NDHR 1988).

The two sources of noise at HWAD are the Controlled Firing Area where mortar testing occurs, and the Western Area Demilitarization Facility to the north of Hawthorne where the demolition of ordnance occurs. Both noise sources are located at a sufficient distance as to not be detected by the general public in Hawthorne (SAIC 1991).

5.5.2.8 *Public Health and Safety*

Aircraft mishaps and objects dropped from aircraft are potential sources of impact on public safety in the NAS Fallon region. As noted in Chapter 3, the chances of people or structures being hit by such objects is very small. Ordnance intended to be dropped on B-16, B-17, and B-19 has fallen on public lands and the Walker River Indian Reservation adjacent to these training ranges. During surface sweeps in 1989 and 1990, live and practice/inert ordnance and ordnance scrap were retrieved, and the effectiveness of surface sweeps in clearing ordnance is estimated to be 92.7 percent. There is currently no reliable means of determining the location of subsurface ordnance (SAIC

1991). Areas presenting the greatest risk of unexploded buried ordnance are those near B-19 and B-17. These lands are under closure by the BLM, and the BLM has requested the Navy to post signs and/or fence these areas.

Accidents involving ordnance are potential sources of public safety effects on HWAD lands. Three serious ordnance-related mishaps have occurred since 1971 at HWAD, but none affected any property or life off-site (SAIC 1991). There is no risk from aircraft accidents or objects or ordnance dropped from aircraft since HWAD does not operate any aircraft (US Army 1990).

As noted in Section 4.2.13.1, there is no indication that aluminum-coated chaff used by the US military poses a threat to human health. None of the materials contained in chaff are known to pose a health hazard. Based on the data available, the materials (aluminum, stearic acid, and silica fiberglass) are irritants and therefore pass easily through the system of those species that might ingest them (SEA 1989; Bohman 1991). Chaff is not known to break down into particles small enough to be an inhalation risk, nor does the type of chaff used at NAS Fallon and elsewhere in the US cause allergic contact dermititis. US chaff manufacturers, when contacted, revealed no instances of allergies or irritation among their employees. These manufacturers stated that while employees are provided with protective gowns and masks, very few choose to use them (Naval Research Laboratory 1995).

5.5.2.9 Transportation

The existing land withdrawals have not affected any major transportation routes in the region because major roads were avoided when these withdrawals were enacted.

5.5.2.10 5Airspace Designation and Use

Airspace designation and use have affected civil aviation in the region. Typically, restricted areas are used by military aircraft from 7:15 AM to 11:30 PM (local time), Monday through Friday, and for a somewhat shorter period on Saturdays. Therefore, nonmilitary aircraft use of this airspace is limited. Civilian aircraft are free to use MOAs when military activity is occurring; however, in practice civilian aircraft often are routed out of the MOAs (SAIC 1991). Dispersion of chaff may have short-term effects on local radar used in air transportation by causing radio frequency pollution. The airspace associated with HWAD is not used for military flying activity. Aircraft transit through the Controlled Firing Area is not restricted. When firing takes place, a ground-based observer watches for overflying aircraft, and if aircraft is spotted, all gunfire is terminated until the aircraft departs the controlled firing area. Civilian aircraft is not allowed to transit R-4811.

5.5.3 Summary

Table 5-5 presents a summary of the land effects of existing land withdrawals and military activity on the region. Existing military land withdrawals cumulatively have withdrawn about four percent of land in the region from public domain. Another 23,364 acres held in fee simple by NAS Fallon are closed to all nonmilitary uses except agriculture, which is conducted under lease. Approximately 23,153 square miles are affected by overflight activity.

TABLE 5-5
LAND EFFECTS OF CURRENT MILITARY ACTIVITY IN THE REGION

Area	Lands Withdrawn (acres)	Lands Used by Permits/ROWs (acres)	Lands Held in Fee (acres)	Lands Affected by Overflight (sq. mi.)	Control Use
NAS Fallon	3,927	0	3,934	–	Portion of lands held in fee is leased out; rest is closed to nonmilitary use.
FRTC	77,589	700	19,430	–	All land is closed to nonmilitary use.
Shoal Site[1]	–	2,764	–	–	Open to nonmilitary use.
Dixie Valley Landholdings	–	–	9,741	–	Portion of lands held in fee is leased out; rest is closed to nonmilitary use.
HWAD	147,431	–	–	–	Only recreational use is allowed on a part of the withdrawal. Other areas are closed to nonmilitary use.
NAS Fallon Airspace	–	–	–	11,345	Civilian aircraft are allowed the use of airspace.
TOTAL	228,628	3,464	33,105	11,345	
REGION TOTAL	5,796,481				

Source: SAIC 1991, Tetra Tech 1992

[1] Used through casual use permits issued by the BLM.

5.6 PROPOSED MILITARY LAND WITHDRAWALS AND AIRSPACE DESIGNATIONS AND THEIR POTENTIAL EFFECTS

5.6.1 Proposed NAS Fallon Land Withdrawal

The proposed NAS Fallon land withdrawal, as described in Chapter 2, would withdraw between approximately 127,365 and approximately 189,080 acres of public lands adjacent to existing training ranges. These withdrawn lands would provide the necessary land area to allow the Navy to maintain and improve realistic operational and strategic combat training and would provide safety buffers around the training ranges. EW, TACTS, and visual cueing device sites would be developed on withdrawn land, and integrated air and ground training would occur. These activities would be contained within the withdrawal area to the extent possible. Any EW or TACTS site or Navy training activity that becomes necessary outside of the proposed withdrawal footprint would continue to be coordinated with the BLM or other appropriate agency.

The withdrawn lands would be placed in land use categories to define compatible land uses with training operations and public uses. All withdrawn lands would be managed under a resource management plan that would be developed by the Navy, in conjunction with the BLM, BUREC, and DOE, subsequent to the withdrawal. The plan would be submitted to the BLM for approval. The land withdrawal would not cause an increase in designated airspace or the size of the range impact areas.

5.6.2 Effects of the Proposed NAS Fallon Land Withdrawal

The impacts of the proposed NAS Fallon land withdrawal and alternatives are described in Section 4.2 and are summarized in Table 2-6.

5.6.3 Proposed NAS Fallon B-20 Land Withdrawal Renewal

The Military Lands Withdrawal Act of 1986 (Public Law 99-606) identified approximately 21,576 acres of land in a checkerboard pattern for Navy use to support the NAS Fallon B-20 training range. PL 99-606 terminates 15 years after enactment (November 6, 2001). The Navy is proposing to renew the land withdrawal at B-20 for continued Navy use. Pursuant to PL 99-606 Section 5, the Navy is preparing a legislative environmental impact statement (LEIS) evaluating the renewal. The LEIS will be released for public review in the spring of 1998.

5.6.4 Effects of the Proposed NAS Fallon B-20 Land Withdrawal Renewal

The effects of the proposed B-20 land withdrawal renewal are evaluated in the LEIS for the Renewal of the B-20 Land Withdrawal at Naval Air Station Fallon, Nevada. No significant impacts to land use, biological resources, geology and soils, water resources, cultural resources, cultural resources, socioeconomics, air quality, noise, mineral resources, livestock grazing and wild horse management, recreation and visual resources, public health and safety, or transportation were identified.

5.6.4 B-16 Airspace Designation Restructuring

Noise from aircraft operations is a common concern, especially when the operations take place near residential areas. Military uses at NAS Fallon, such as low-flying high-speed aircraft, have resulted in such concerns by the state of Nevada and the public. The region that has been most affected by aircraft noise is the area north of B-16, known as the Sheckler District. The Navy is investigating changes in aircraft flight patterns at B-16 to reduce noise levels in this area. The Navy already realigned 12 MTRs to terminate at B-20 instead of B-16, which has reduced noise levels around B-16. Airspace changes are a separate action from the land withdrawal action evaluated in this EIS.

Aircraft training at B-16 takes place in restricted airspace R-4803N and R-4803S and run-in lines that approach B-16 from north-northwest, resulting in noise complaints from nearby Sheckler District residents. The existing airspace designations in the vicinity of B-16, both restricted and military operations areas (MOAs), are shown in Figure 5-2. The Navy proposes to lessen noise effects north of B-16 by changing aircraft flight patterns using a run-in line approach to B-16 from the south. Modifying the flight patterns would necessitate restructuring airspace over and south of B-16. Under the proposal, three joint-use MOAs would be established—Churchill Low, Churchill High, and Ranch High. Creating the new Churchill MOAs would allow for disestablishing all of R-4803N and part of R-4803S (Figure 5-3). Disestablishing the restricted airspace north of B-16 would simplify flying for general aviation aircraft coming from the Yerington, Silver Springs, and Fallon Municipal airports. A portion of the Ranch MOA also would be disestablished, as the airspace would no longer be needed for training. The net effect of the airspace restructuring would be to decrease designated airspace at B-16 by approximately 112 square miles.

The Churchill Low MOA would include airspace from 500 AGL (feet above ground level) up to and including 9,000 feet above mean sea level (MSL). The Churchill High MOA would include airspace above the Churchill Low MOA from 9,000 MSL up to but not including flight level 180 (18,000 feet above mean sea level). The Ranch High MOA would be located above the existing Ranch MOA and would include airspace from 9,000 MSL up to and including 13,000 MSL. The western portion of the Ranch MOA would be disestablished from the MOA boundary. All of R-4803N and the northern part of R-4803S would be disestablished. Table 5-6 details the boundary locations of the current and proposed airspace.

Flights originating out of NAS Fallon, which account for approximately 95 percent of all range activity at B-16, would enter B-16 from the southeast at an approximate elevation of 9,500 MSL (approximately 5,000 feet AGL). Flights

TABLE 5-6
CURRENT AND PROPOSED AIRSPACE BOUNDARIES

Name of Airspace	Current Boundaries	Proposed Boundaries
R-4803N	Beginning at: lat. 39°34’53”N., long. 118°59’36”W. to lat. 39°35’48”N., long. 118°53’14”W. to lat. 39°26’48”N., long. 118°51’03”W. to lat. 39°30’00”N., long. 118°58’30”W. to the point of beginning.	Release this airspace for public use.
R-4803S	Beginning at: lat. 39°30’00”N., long. 118°58’30”W. to lat. 39°26’48”N., long. 118°51’03”W. to lat. 39°23’13”N., long. 118°50’10”W. then via the 3NM arc radius circle centered at lat. 39°20’40”N., long. 118°52’15”W. to lat. 39°20’07”N., long. 118°56’03”W. to the point of beginning.	3NM arc centered at: lat. 39°20’40”N., long. 118°52’15”W. to the point of beginning.
Ranch MOA	Beginning at: lat. 38°58’00”N., long. 118°42’50”W. to lat. 39°17’00”N., long. 118°21’00”W. to lat. 39°12’10”N., long. 119°11’00”W. to lat. 39°04’00”N., long. 119°11’00”W. to the point of beginning.	Beginning at: lat. 39°58’00”N., long. 118°42’50”W. to lat. 39°17’00”N., long. 118°21’00”W. to lat. 39°13’15”N., long. 119°00’00”W. to lat. 39°01’50”N., long. 119°00’00”W. to the point of beginning.
Churchill Low MOA	Not currently established.	Beginning at: lat. 39°23’43”N., long. 119°02’00”W. to lat. 39°13’15”N., long. 119°02’00”W. to lat. 39°14’25”N., long. 118°49’25”W. to lat. 39°20’12”N., long. 118°48’20”W. then via the 3NM arc centered at lat. 39°20’40”N., long. 118°52’19”W. to lat. 39°23’43”N., long. 118°53’00”W. to the point of beginning, excluding the airspace within R-4803.
Churchill High MOA	Not currently established.	Beginning at: lat. 39°23’43”N., long. 119°02’00”W. to lat. 39°13’15”N., long. 119°02’00”W. to lat. 39°14’00”N., long. 118°53’00”W. to lat. 39°18’30”N., long. 118°50’10”W. then via the 3NM arc centered at lat. 39°20’40”N., long. 118°52’19”W. to lat. 39°23’43”N., long. 118°53’00”W. to the point of beginning, excluding the airspace within R-4803.
Ranch High MOA	Not currently established.	Beginning at: lat. 39°13’15”N., long. 119°02’00”W. to lat. 39°08’00”N., long. 119°01’00”W. to lat. 38°59’11”N., long. 118°48’00”W. to lat. 39°14’25”N., long. 118°49’25”W. to the point of beginning.

originating out of other facilities, such as NAS Lemoore, California, and NAS Miramar, California, which account for the remaining B-16 flight activity, would enter B-16 from the southwest using existing low-level routes at an approximate elevation of 9,500 MSL (approximately 5,000 feet AGL). No increase in the number of flights over Walker River Indian Reservation would occur.

5.6.5 Potential Effects of the B-16 Airspace Designation Restructuring

The potential effects of the B-16 airspace designation restructuring are examined below. The airspace restructuring would involve rerouting the flight patterns to approach B-16 from the south instead of from the north and restructuring airspace to accommodate that change. No increase in the number of flights or size of the target area would occur.

5.6.5.1 Water Resources

No impacts to water resources are anticipated from the airspace designation restructuring.

5.6.5.2 Biological Resources

The change in flight patterns at B-16 would reduce noise levels near Sheckler Reservoir, thereby benefiting bald eagle habitat and waterfowl. No impacts to sensitive biological resources are expected from the new airspace designations.

The new flight pattern would result in increased noise levels immediately south of B-16. No sensitive species are known to exist in this area. There are rock outcrops and cliff-like rim rocks that may provide habitat for raptors and other birds on the lands south of B-16. An NAS Fallon biologist conducted a site survey on March 4, 1996, and did not observe any raptors or residue from old bird nests. Stains on the rocks were noted, which may indicate a rodent population (Rathbun 1996a). Based on the literature review discussed above, many raptors inhabiting this area are expected to habituate to noise levels. Although there may be short-term startle effects, reproduction is not expected to be affected (Ellis et al. 1991; Anderson et al. 1989; Manci et al. 1987, NDOW 1989).

5.6.5.3 Land Use

The proposed B-16 airspace designation restructuring would have no impacts on mining or grazing underneath this airspace. The airspace designation restructuring would result in decreased noise levels north of B-16, benefiting recreation in the Sheckler District. The action would result in increased noise levels south of B-16, potentially affecting recreation south of B-16 during times that aircraft training is occurring. The Navy will work to alter training to the extent practicable to reduce noise during permitted organized events on the Pony Express National Historic Trail.

5.6.5.4 Socioeconomics and Environmental Justice

Airspace designations are not expected to have any socioeconomic impact. Beneficial impacts are expected from the proposal to change the flight direction at B-16 from a northerly approach to a southerly approach. During public scoping, county and state officials and local residents voiced concerns about noise resulting from the existing approach pattern to B-16. The current approach has resulted in complaints from residents living north of B-16. The proposed approach would use airspace south of B-16 over public land that is undeveloped and sparsely populated. Therefore, the decreased overflight west of Fallon and north of B-16 would be a beneficial impact for all residents in the Sheckler District regardless of income and race.

The Churchill MOAs would be established over and north of the Walker River Indian Reservation. Relocating the flight operations from R-4803N to the MOAs would increase noise levels south of B-16; however, military air operations would occur north of the reservation and at a high altitude (approximately 5,000 feet AGL) when directly above the reservation. Although audible, the noise levels would be less than 60 dB, a noise level that can be compared to the sound of an air conditioner operating 100 feet away. Activities such as grazing, recreation, ranching, and mining would not be affected by the proposal. The small number of operations in the proposed Ranch High MOA would not significantly affect most activities in the reservation because these aircraft would be at an altitude higher than historical operations in the Ranch MOA. For these reasons, the proposed change in flight patterns was not found to have disproportionately high and adverse human health or environmental effects on minority or low-income populations.

5.6.5.5 Visual Resources

The airspace designation restructuring would have no effect on visual resources.

5.6.5.6 Cultural Resources

The airspace designation restructuring would have no significant adverse effects on cultural resources in the area.

5.6.5.7 Noise

In response to concerns about aircraft operations north of B-16, the Navy initiated two noise studies. The 1995 Aircraft Noise Study for the B-16 Range Complex (U.S. Navy 1995f) used the DOD-approved NOISEMAP model and 1994 "busy day" operations data to update the noise contours around B-16. A busy day is defined as any 24-hour period in which the day's total operations are at least 50 percent of the annual average daily operations. The average busy day Ldn contours are shown on Figure 5-4. With the current operations and airspace configurations near B-16, the City of Fallon and residential developments near Sheckler Reservoir are outside the 60 dBA Ldn contours. While these areas are outside the 60 dBA Ldn contours, concerns as to noise levels north of B-16 still were raised at the scoping meeting by residents and by the state of Nevada.

The 1996 Aircraft Noise Study for the Proposed B-16 Range Complex (U.S. Navy 1996b) evaluated noise levels of the proposed airspace designation restructuring using the same DOD-approved NOISEMAP model and 1994 "busy day" operations data as the 1995 study of existing noise conditions. Figure 5-5 illustrates the modeled noise contours around B-16 if this action were implemented. As shown on Figure 5-5, City of Fallon and Sheckler District residents would be well outside the 60 dBA Ldn contour lines under proposed modified flight approach patterns.

Given that the land south of B-16 is rural undeveloped public land and that there are no nearby permanent settlements, this action would mitigate noise concerns north of B-16 while not causing significant noise impacts south of B-16. Aircraft would approach B-16 at 9,500 feet MSL, which will minimize startle effects. Noise levels over the Walker River Indian Reservation would not exceed an average Ldn of 60 dB, as discussed in Section 5.6.6.4, and would not result in a significant impact.

5.6.5.8 Public Health and Safety

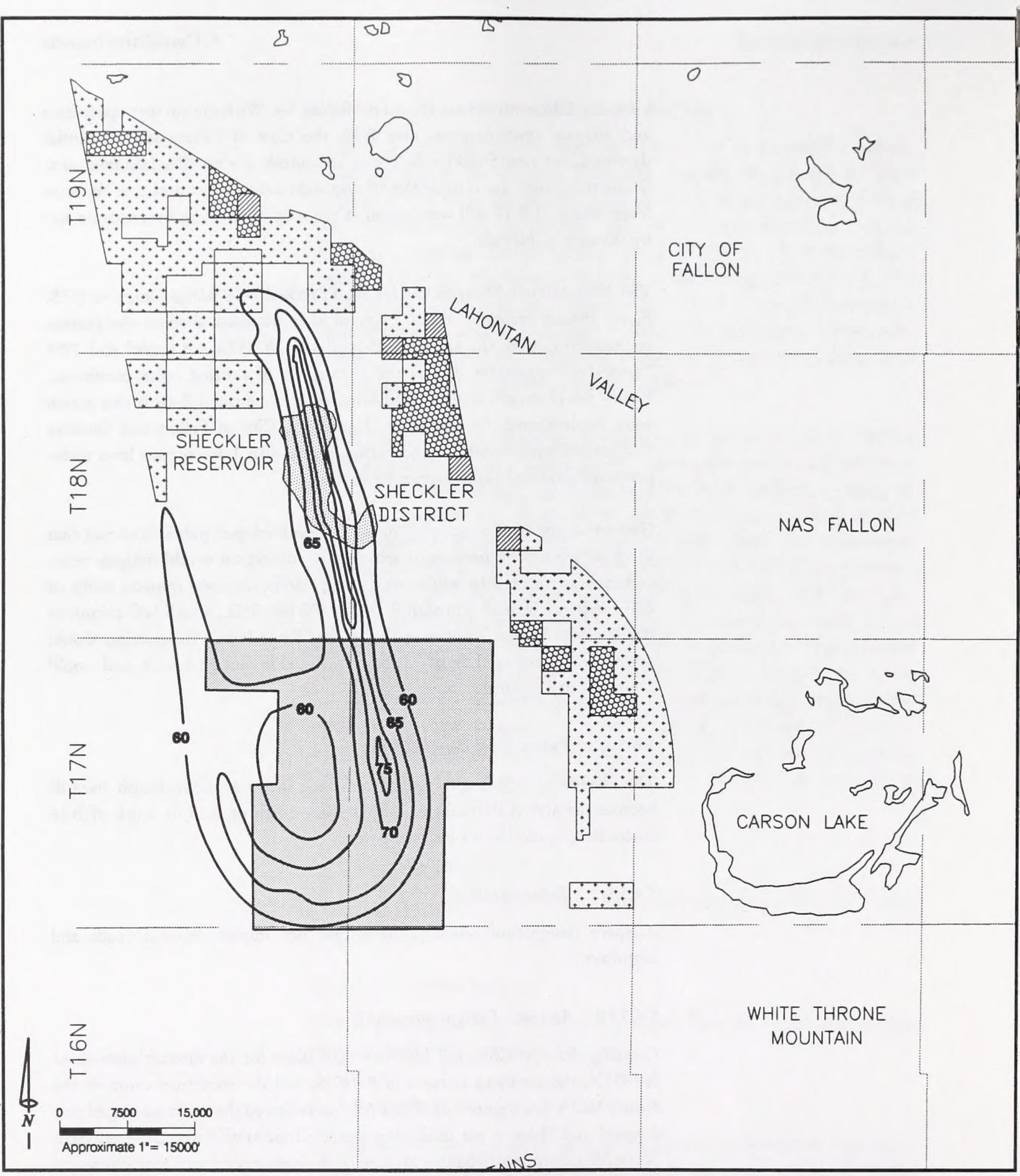
The change in B-16 flight paths would not increase public health hazards because the action shifts flight activity from north of B-16 to south of B-16 where the population is significantly less.

5.6.5.9 Transportation

Airspace designation restructuring would not impact regional roads and highways.

5.6.5.10 Airspace Designation and Use

Creating the new Churchill MOAs would allow for the disestablishment of R-4803N, the northern portion of R-4803S, and the western portion of the Ranch MOA (see Figure 5-3). The FAA has reviewed the restructuring of this airspace and there is no indication that civil air traffic would be affected. None of the proposed changes in designated airspace occur in a major airway.



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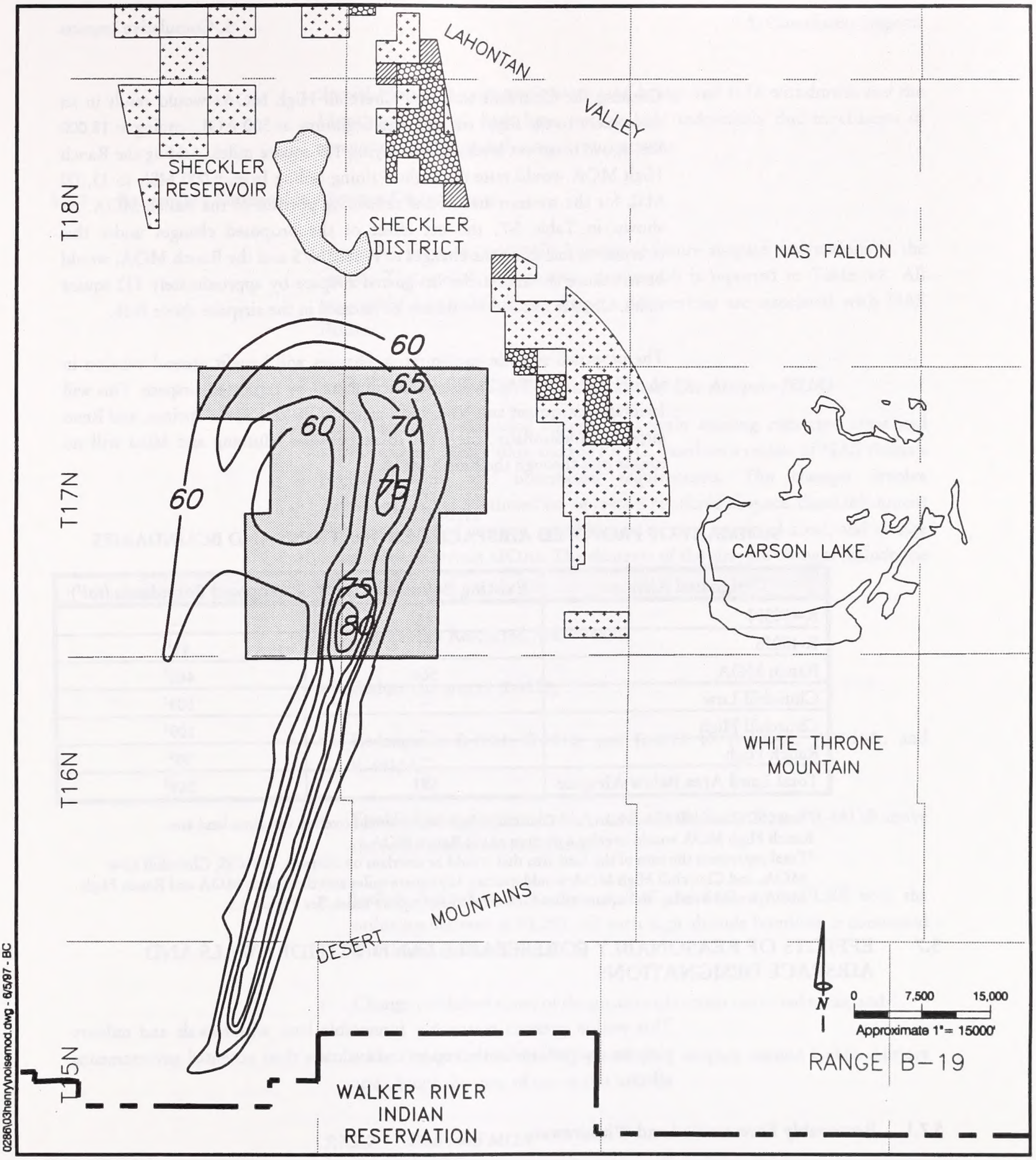
A 1995 study of B-16 mapped the noise contours for current operations. The residential densities of the Sheckler District also are presented.

Source: US Navy, 1995f.

Average Busy Day Noise Contours at B-16 Under Current Conditions

NAS Fallon, Nevada

Figure 5-4



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The Navy has proposed flight approach patterns to alleviate noise impacts north of B-16 in the Sheckler District.

Source: US Navy, 1996

Average Busy Day Noise Contours at B-16 Under Modified Conditions

NAS Fallon, Nevada

Figure 5-5

Creating the Churchill Low and Churchill High MOAs would result in an adjustment to the flight training area beginning at 500 AGL, ending at 18,000 feet above mean sea level and overlaying 109 square miles. Adding the Ranch High MOA would raise the flight training ceiling from 9,000 MSL to 13,000 MSL for the western area of the remaining portion of the Ranch MOA. As shown in Table 5-7, the net effect of the proposed changes under this alternative, including the changes to R-4803N/S and the Ranch MOA, would be to reduce the area under designated airspace by approximately 112 square miles. Chaff is not and would not be released in the airspace above B-16.

The proposed airspace configuration changes will benefit general aviation in that Hazen VORTAC will be unencumbered by restricted airspace. This will facilitate instrument and VFR approaches to Fallon, Silver Springs, and Reno airports. Additionally, the VFR route between Mustang and Mina will no longer pass through the Ranch MOA.

TABLE 5-7
SUMMARY OF PROPOSED AIRSPACE DESIGNATIONS AND BOUNDARIES

Designated Airspace	Existing Boundaries (mi^2)	Proposed Boundaries (mi^2)
R-4803N	46	--
R-4803S	71	41[1]
Ranch MOA	564	460[2]
Churchill Low	--	109[1]
Churchill High	--	109[1]
Ranch High	--	98[2]
Total Land Area Below Airspace	**681**	**569[3]**

[1] R-4803S, Churchill Low MOA, and Churchill High MOA would overlay the same land area.
Ranch High MOA would overlay a portion of the Ranch MOA.
[3] Total represents the sum of the land area that would be overlain by airspace. R-4803S, Churchill Low MOA, and Churchill High MOA would overlay 109 square miles and the Ranch MOA and Ranch High MOA would overlay 460 square miles for a total of 569 square miles. See Figure 5-3.

5.7 EFFECTS OF REASONABLY FORESEEABLE LAND WITHDRAWALS AND AIRSPACE DESIGNATIONS

This section presents reasonably foreseeable land withdrawals and military airspace designations in the region and evaluates their potential environmental effects.

5.7.1 Reasonably Foreseeable Land Withdrawals

There are no reasonably foreseeable land withdrawals associated with NAS Fallon or HWAD. The Special Nevada Report (SAIC 1991) listed two foreseeable land withdrawals in Nevada, the Navy B-17/B-19 land bridge and B-18 range and the Army's Hawthorne RCTC. Since publication of the

Special Nevada Report, the Navy's land bridge and B-18 withdrawal and the Hawthorne RCTC have been put on hold indefinitely due to changes in weaponry and the global tactical requirements.

5.7.2 Reasonably Foreseeable Airspace Designations

Figure 5-3 presents reasonably foreseeable future airspace designations in the region. The size of each airspace designation is reported in Table 5-2. All reasonably foreseeable future airspace designations are associated with NAS Fallon.

5.7.2.1 Alterations of NAS Fallon Special Use Airspace (SUA)

The Navy is investigating changes to certain existing restricted areas and MOAs around NAS Fallon and the FRTC, based on a review of NAS Fallon's overall training and operational requirements. The changes involve redesignation and continued use of certain restricted airspace, disestablishment of some restricted airspace, establishment of new restricted areas, and change in use time of certain MOAs. The elements of the airspace changes include the following:

- Disestablish Restricted Area R-4802;
- Reduce the area of R-4813;
- Redesignate R-4804, R-4810, and R-4813 to R-4804A, R-4810A, and R-4813A;
- Establish joint-use Restricted Areas R-4804B, R-4810B, and R-4813B above the redesignated restricted areas;
- Include high altitude bombing at B-17 and B-20; up to FL300 with the ordnance delivery at FL290. All such high altitude bombing is conducted with authorization from FAA;
- Change published times of designation of certain restricted areas; and
- Alter Gabbs Central MOA by excluding airspace around Gabbs Airport and change the time of use of this MOA.

5.7.2.2 Diamond MOA

This reasonably foreseeable MOA could overlay 2,085 square miles, with a floor of 10,000 feet MSL and ceiling of 18,000 feet MSL. This would be used for strike aircraft rendezvous (when attack aircraft regroup during ingress prior to striking the target) and for stand-off jammer operations (when electronic aircraft stand at a distance to jam enemy radar while strike aircraft approach). A part of the MOA would be used for supersonic activity (SAIC 1991). An ATCAA would be established over this airspace.

5.7.2.3 *Duckwater MOA*

This MOA could overlay 4,818 square miles. The floor and ceiling altitudes of this MOA could be the same as noted above for the Diamond MOA. This would be used to provide a rendezvous area (where aircraft regroup) and a jammer axis (electronic jamming area) (SAIC 1991). An ATCAA would be established over this airspace.

5.7.2.4 *Smokey MOA*

This MOA could overlay 3,853 square miles, with a floor of 200 feet AGL and ceiling altitude of 18,000 feet MSL. This MOA would provide a tactical low-level ingress to B-17 and B-19 target areas. An ATCAA would be established over this airspace.

5.7.2.5 *Reno MOA*

The Reno MOA is an existing MOA, however scheduling and user agency authority could change from 152 Airlift Wing Reno, Nevada Air National Guard to Commander, Naval Strike and Air Warfare Center, Fallon, Nevada. The Reno MOA is located 40 miles north of Reno and covers approximately 1,380 square miles. This MOA overlies the Smoke Creek Desert, Winnemucca Lake, and part of the Black Rock Desert, and is above the towns of Empire and Gerlach. The Reno MOA extends from 13,000 feet MSL up to, but not including FL180, with an overlying ATCAA up to FL310. The Reno MOA/ATCAA is used for reconnaissance training, air combat training, air refueling, instrument training, flight testing, and proficiency training. Supersonic operations are not permitted, except above FL300.

5.7.3 Potential Effects of Reasonably Foreseeable Airspace Designations

Potential effects of these actions are examined below to provide an analysis of long-range cumulative effects. A degree of uncertainty is associated with the actions, and these actions are subject to change prior to implementation. The effects described below are based on general examination of the conditions and resources currently in the region. More precise impacts would be determined through project-specific NEPA analyses.

5.7.3.1 *Water Resources*

No impacts to water resources are anticipated from airspace designations.

5.7.3.2 Biological Resources

The proposed airspace designations potentially would enlarge the area that would be affected by overflights, although there would be no increase in the number of flights. Wildlife in these areas could be subject to some startle effects, but studies of effects from existing flight activities suggest that they would not be significant (NDOW 1989; Krausman 1993a, b, c; Workman et al. 1992; Ellis et al. 1991; Anderson 1989; Manci et al. 1987).

5.7.3.3 Land Use

The proposed airspace designations may have impacts on mining and grazing underneath the proposed Smokey MOA airspace space from low altitude flights. The designations could reduce recreational values from increased noise.

5.7.3.4 Socioeconomics and Environmental Justice

Airspace designations are not expected to have any socioeconomic impact or result in disproportionately high and adverse human health or environmental effects on minority or low-income populations.

5.7.3.5 Visual Resources

The future airspace designations would have no effect on visual resources.

5.7.3.6 Cultural Resources

The lands under the airspace have the potential to contain cultural resources. The location and type of resources are unknown at this time. The Navy would have to undertake some effort to identify cultural resources and evaluate potential effects to cultural resources and determine their significance in the area of the MOAs from low altitude flights, as per the requirements of the CRMP and PA.

5.7.3.7 Noise

The reasonably foreseeable airspace designations have the potential to affect noise levels. The recent MTR revisions reduced the flight activity focused on B-16, thus reducing noise levels over the Sheckler District. Creating the Diamond, Duckwater, and Smokey MOAs would enlarge the area in which noise effects would be recorded. Noise effects would be relatively greater under Smokey MOA, given that the MOA floor may be at 200 feet AGL. The area of supersonic operations may be expanded as part of the Diamond MOA; however, the flight activity in the new MOAs would be very dispersed and generally would be conducted at altitudes above 15,000 feet AGL. In addition, the area underlying this airspace is not densely populated, and sensitive receptors in the area are few.

5.7.3.8 Public Health and Safety

The MTR revisions enhanced safety by removing overflight activity from the relatively more populated parts of the region. The net effect would be that fewer persons would be at risk from objects dropped by aircraft or other aircraft mishaps.

The NAS Fallon SUA alterations would slightly increase the hours of use of the airspace. As no increase in sorties is planned, the increase in use time would reduce the hourly frequency of flying in the region and would enhance safety. Establishing these future MOAs would increase the area that is at risk from objects dropped inadvertently by aircraft and aircraft mishap. However, due to low population density, the risk factor under the airspace is extremely low.

5.7.3.9 Transportation

Airspace designations would not impact regional roads and highways.

5.7.3.10 Airspace Designation and Use

Establishing of the Diamond, Duckwater, and Smokey MOAs would encourage civilian aircraft to use this airspace with assistance from air traffic controllers. Establishing new restricted areas above the four existing restricted areas essentially would raise the ceiling of restricted areas to flight level 300 (30,000 feet above MSL) from the current levels. Currently, these proposed restricted areas fall within the established ATCAAs, and nonhazardous military use occurs through coordination with the Oakland and Salt Lake City Centers. With the designation of the proposed restricted areas, the Navy would use the airspace at designated use times, and civilian aircraft would be routed around these areas. The net effect would be that a larger airspace around Fallon would be restricted for military aircraft to conduct hazardous operations, protecting civilian lives and aircraft that necessarily would be rerouted around that airspace by FAA and NAS Fallon air traffic controllers. This would result in greater air safety. The change to Gabbs Central MOA would improve conditions for civilian aircraft operations in the vicinity of Gabbs Airport.

5.8 REGIONAL CUMULATIVE EFFECTS

This section discusses the cumulative effects of DOD use of existing, proposed, and reasonably foreseeable land withdrawals and airspace designations. Approximately four percent of the land in the cumulative effects region is withdrawn for defense purposes. Another 1.1 percent of the land area is used for defense-related activities but is not withdrawn. Under the NAS Fallon land withdrawal preferred alternative, about 127,365 acres would be withdrawn for military training and to provide safety buffers around existing ranges. If this acreage were added to existing withdrawals, a cumulative total of approximately eight percent of the region's acreage (5.7 million acres) would be affected by withdrawals for military training.

As noted in the preceding sections, varying levels of land use controls apply to existing and proposed land withdrawals. Lands currently withdrawn for NAS Fallon and the FRTC are closed to nonmilitary uses, although lands held in fee simple at NAS Fallon are leased out for agriculture. Some parts of the existing HWAD withdrawal are open for recreational use with military approval. Other uses, such as grazing and mining, are not permitted. Under the NAS Fallon proposed land withdrawal, current access characteristics generally would be maintained, and present uses of lands would continue on most of the lands proposed for withdrawal. Land use restrictions would apply on the remaining lands.

5.8.1 Water Resources

It is likely that land-disturbing activities on the withdrawn lands may have caused an increase in sedimentation in some of the surface water resources. However, there is no indication that significant impacts to surface water resources have occurred as a result of land withdrawals and subsequent military use.

Ground water resources within withdrawn lands are not expected to be significantly affected by continued military activities. Ground water contamination has been identified at DOD sites and remediation programs have been adopted to mitigate effects. Monitoring and hazardous material and waste management policies have been implemented to prevent future actions that could result in ground water contamination.

Most withdrawn lands restrict access for the development of water sources. As the population of Nevada continues to expand, and the demand for water increases, these restrictions may hinder growth opportunities. Water management plans and access rights could be developed between the state and DOD if needed to address water demand issues.

5.8.2 Biological Resources

Habitat conditions on DOD withdrawn lands have been affected by construction and military activities, including the delivery of explosive ordnance and ground-based training, and from noise due to aircraft overflights and ordnance detonation. Continued use of the withdrawn lands would further degrade habitat conditions near impact areas. The habitat quality at these areas, however, is already low due to past use. Wildlife on withdrawn lands may have startle effects due to overflights. This may produce a variety of responses from short-term mild interest to extreme distress, which may result in fleeing, panic calling, reduced foraging, and reduced reproduction. The extent of the effect is a function of the type and intensity of activity, the wildlife species, population, or habitat type exposed to the activity, and the nature and duration of the interaction. Past studies suggest that most ungulates and avian species potentially found on withdrawn lands habituate to aircraft noise (SAIC 1991), although the level of effect cannot be conclusively determined. It is evident that military activities have not had a widespread catastrophic effect on wildlife and vegetation in Nevada. Continued use would result in similar effects as currently resulting from military operations.

5.8.3 Land Use

5.8.3.1 Mining

Existing land withdrawals have affected the discovery and development of two areas with moderate to high potential for precious metals. The proposed NAS Fallon land withdrawal would remove some areas with high mineral potential from open public use, affecting both discovery and development of minerals. While it is not possible to determine the economic loss that has resulted or would result from these actions, economic losses, in terms of lost opportunities, may be offset by income and employment generated by military activities. Reasonably foreseeable airspace designations would not result in cumulative effects on mining.

5.8.3.2 Grazing

Existing DOD land withdrawals have taken land out of potential grazing and livestock production. The NAS Fallon proposed land withdrawal would remove from grazing approximately 75 acres for developed military sites. In addition, no grazing would be allowed on Category A lands, resulting in the loss of an additional 40,280 acres. In all, 1,130 AUMs could be affected by the land withdrawal, or 1.4 percent of the 80,000 AUMs in the Lahontan Resource Management Area. While existing and proposed land withdrawals have and would result in lost revenue from grazing and agriculture, indirect growth in the private sector to support military facilities likely exceeds that lost from grazing and agriculture. Changes in airspace will not affect sheep or livestock production.

5.8.3.3 Recreation

NAS Fallon landholdings contain some potential for hunting, and this activity has been reduced in the region due to the withdrawals. Under all NAS Fallon land withdrawal alternatives, recreation in the Fairview Mining District would not be allowed. The withdrawal also could affect a part of the Job Peak WSA under Alternative I. The Job Peak WSA is not, however, included in the withdrawal footprint under the preferred alternative. While other parts of Churchill and Mineral Counties and the State of Nevada offer recreational opportunities similar to those that have been or would be lost because of the withdrawals, military activities have affected the quality of recreational experiences in portions of Churchill County, particularly in the Dixie Valley basin. The cumulative effects of overflights, developments, and operations have impacted the primitive and wilderness recreation opportunities in small and localized areas for a portion of recreationists. The Special Nevada Report included the results of a survey of recreationists' perceptions of overflight in which 39 percent of those surveyed were annoyed by overflight and 61 percent were not affected by overflight (SAIC 1991). Restructuring of airspace and changes in flight patterns proposed at B-16 would have a positive effect on recreational experiences north of B-16 at the Sheckler Reservoir with only minor losses of recreation experience elsewhere around B-16.

5.8.4 Socioeconomics

Defense-related activities on withdrawn lands in Nevada are projected to contribute $2,027 million to the state Gross Regional Product by the year 2000 and employ approximately 22,000 people (SAIC 1991). This represents approximately four percent of the total state Gross Regional Product and over two percent of total state employment. The primary economic trade-off of DOD use is the land use restrictions placed on withdrawn lands, which prevent or limit agriculture, grazing, mining, and recreation. The economic value of these foregone opportunities would not exceed current contributions to the state economy from the DOD.

All populations would continue to be equally impacted by defense operations; therefore, no disproportionately high or adverse effects are expected to minority or low-income communities. Similarly, defense-related actions on withdrawn lands are not known to result in environmental health risks and safety risks that disproportionately affect children.

5.8.5 Visual Resources

Most withdrawn lands used by the military are remote and similar in topography and scenic quality with surrounding lands. Land-disturbing activities, such as ordnance detonation, have affected the visual qualities by creating unnatural features, including structures and craters. Continued use of these areas may culminate in additional alterations to the viewshed. These effects, however, would not be significant because of the homogeneity within viewsheds and because there are few sensitive receptors, such as highways, homes, and high-use recreation areas, near the withdrawn lands.

5.8.6 Cultural Resources

Defense-related activities have impacted cultural resources located on withdrawn lands in Nevada (SAIC 1991). The Air Force, Navy, and Army have adopted or are developing cultural resource management plans to minimize future impacts. Inadvertent losses may still occur from military uses; however, historically and archaeologically significant resources on withdrawn lands are not expected to be impacted. Any direct effects to significant identified cultural resources would be addressed through the procedures set forth in 36 CFR 800 for compliance with Sections 106 and 110 of NHPA. Cultural resources on the NAS Fallon withdrawn lands would be identified and managed through the NAS Fallon CRMP consistent with the NHPA and PA. On withdrawn lands restricted from public access, beneficial effects to cultural resources could occur in the form of reduced pilferage and vandalism and reduced traffic on identified and unidentified sites.

5.8.7 Noise

Noise associated with military activity results from aircraft overflights, helicopter operations, ground-based training, including vehicle operations, and live ordnance explosions. As populations increase around DOD facilities, the potential for noise complaints may increase. The City of Fallon has adopted land use and building codes to try to reduce such incompatible land uses. The region around NAS Fallon will continue to be exposed to aircraft noise, but MTR revisions have reduced and airspace restructuring described under Section 5.6.5 would reduce noise north of B-16, and the potential creation of new MOAs would allow the current and projected sorties to be flown in a more dispersed pattern. In other words, the use of airspace would be less dense. Establishing the Diamond, Duckwater, and Smokey MOAs would increase the total area that would receive noise impacts from general airspace use and from sonic booms but should reduce the frequency of impacts.

5.8.8 Public Health and Safety

Current military activities do not cause unreasonable risks to the health, safety, or property of the citizens of Nevada (SAIC 1991). Although military activities have introduced an element of risk to the public in the region, existing and proposed safety procedures, buffers, and training restrictions at the facilities and the ranges have reduced or would reduce the potential magnitude of risk to an acceptable level. The proposed NAS Fallon land withdrawal would make inaccessible to the public those areas that have been affected by ordnance in the past or that potentially could be affected in the future. The continued use of chaff is not thought to adversely impact public health, though the General Accounting Office currently is studying the effects of chaff use on the human and natural environment. The addition of new airspace could result in risks from aircraft mishaps in previously unaffected areas.

5.8.9 Transportation

Cumulatively, the land withdrawals and airspace designations would not significantly affect ground transportation. No major roads would be closed, and only minor roads would be affected.

5.8.10 Airspace Designation and Use

The military airspace designations have the potential to change civil aviation in the FRTC. Creating new MOAs and restricted areas could place additional restrictions on civil aircraft, but these would be balanced partially by disestablishing portions of other MOAs and restricted areas.

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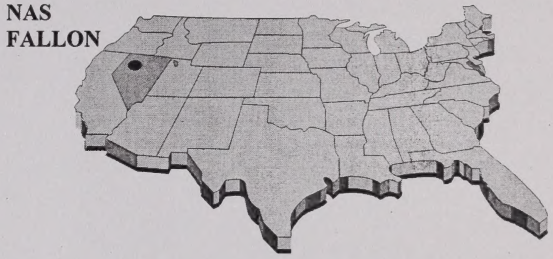

6.0 LIST OF PREPARERS

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The Navy contracted Woodward-Clyde Consultants in 1991 to prepare a Supplemental DEIS for the master land withdrawal. The document was completed but not reviewed or finalized. In 1995, Tetra Tech, Inc. was contracted to conduct a new public scoping effort and revise the Supplemental DEIS. Additional information and analysis was incorporated into the report to make it a stand-alone DEIS.

US Navy Technical Staff

EFA West

Sam Dennis
Environmental Planning Branch

Ed Loo
Real Estate Division

NAS Fallon

Captain Scott Ronnie
Commanding Officer, NAS Fallon

Commander **J.M. Amicarella**
NSAWC Range Department

LT Frank Colon
Command Judge Advocate

Cliff Creger
Base Archeologist

Ron Freitas
Air Traffic Control

LCDR Dave Hill
NSWAC Range Officer

Ester Hutchison
Natural Resource Division

Commander Steve Iselin
Public Works Department

Larry Jones
Natural Resource Division

LT Commander Bruce Lankford
Naval Strike and Air Warfare Center

Keith Mickelson
Public Works Department

Floyd Rathbun
Base Biologist

John Smith
Range Department

LT Linda Veenstra
Command Judge Advocate

LT Mike Van Wie
Air Traffic Control

Cooperating Agency Representatives

Dan Jacquet
BLM Carson City District

Terry Knight
BLM Carson City District

David Loomis
BLM Carson City District

Chuck Pope
BLM Carson City District

Other Agency Involvement

Les Monroe
Department of Energy

Tetra Tech, Inc.

Project Management

David Batts
MS, Natural Resource Planning and Policy, Michigan State University, Lansing
BS, International Development, Lewis and Clark College, Portland, Oregon
Years of Experience: 8
(Project Manager; Purpose and Need, Alternatives)

Nolan Rhem
BA, International Relations, University of Virginia, Charlottesville, VA
Years of Experience: 9
(Assistant Project Manager, Airspace Use)

Amy Cordle
BS, Civil Engineering, Virginia Polytechnic Institute and State University
Years of Experience: 5
(Deputy Project Manager; Mining, Air Quality, Noise)

Technical Team

John Bock
BS, Environmental Toxicology, University of California, Davis
Years of Experience: 4
(Public Health and Safety, Livestock Grazing, Recreation)

Kathy Buescher
BS, Biology University of Redlands, Redlands, California
Years of Experience: 8
(Biological Resources)

Matt Dulcich
BS, Environmental Policy Analysis and Planning, University of California, Davis
Years of Experience: 4
(Socioeconomics, Land Use, Transportation)

Karen E. Frye
BS, The Political Economy of Natural Resources, University of California, Berkeley.
Years of Experience: 10
(Technical Review)

Phyllis Potter
MA, Environmental Planning, California State University, Long Beach
BA, Fine Arts, Portland State University
Years of Experience: 17
(Land Use, Recreation, Transportation, Visual)

Robert Sculley
MS, Ecology, University of California, Davis
BS, Zoology, Michigan State University
Years of Experience: 24
(Air Quality, Noise)

Randolph Varney
BA, Technical and Professional Writing, San Francisco State University
Years of Experience: 5
(Technical Edit)

Tom Whitehead, RG
MS, Hydrology, University of Arizona
BS, Geology, California State University, Hayward
Years of Experience: 14
(Geology and Water Resources)

Sub-Consultants to Tetra Tech

William Self and Associates
(Cultural Resources)

Richard Thompson
(Mineral Resources)

Woodward-Clyde Consultants

Project Management

Gail B. Boyd, Vice President
MS, Environmental Engineering
Years of Experience: 20
(Project Manager, Water Resources, Noise Airspace, Designation and Use, and Public Health and Safety)

Sally Morgan
MA, Anthropology
Years of Experience: 16
(Project Manager)

Catherine Palter
MS, Mineral Economics
Years of Experience: 6
(Geology, Mineral Resources, Recreation, and Visual Resources)

Technical Team

Shabnam Barati
PhD, Geography
Years of Experience: 8
(Transportation and Cumulative Impacts)

Vance Bente'
MA, Anthropology
Years of Experience: 16
(Cultural Resources)

David Fee
MA, Anthropology
Years of Experience: 12
(Land Use and Socioeconomics)

Ron Freeman
BA, Biological Sciences
Years of Experience: 10
(Biology)

Robbi Keil
MS, Meteorology
Years of Experience: 7
(Air Quality)

Ross Wagner
PhD, Geology
Years of Experience: 18
(Geotechnical Resources)

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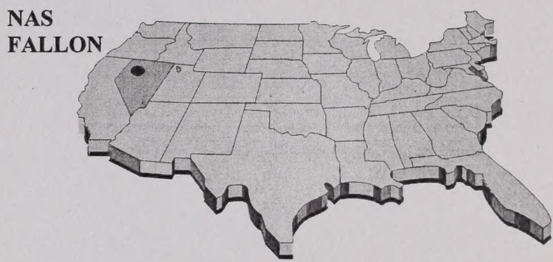

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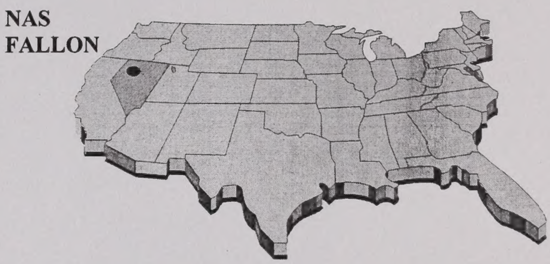


APPENDICES

APPENDIX A HISTORY OF THE LAND WITHDRAWAL

The original withdrawal proposal, announced in 1982, has been redefined in several ways over the past thirteen years. The basic proposal, to provide realistic operational and strategic training, and to provide noise and safety buffer zones adjacent to the ranges remains. Most notable changes have concerned (a) clarifying the military's purpose for withdrawing the land; (b) defining policies for how the lands would be managed after being withdrawn; (c) explaining the proposed Resource Management Plan and its effects on public access; and (d) refining the boundaries of the areas to be withdrawn. Table A-1 is a time line showing the steps through which the withdrawal proposal has been refined.

In 1981 through 1982, the Navy conducted the RAICUZ analysis on the ranges, which recommended withdrawal of 181,323 acres of federally owned lands. In 1982, the Navy filed an application with the BLM to withdraw the subject lands, filed a notice in the Federal Register, and published formal public notices in newspapers throughout north-central Nevada. It also announced and held scoping meetings with state and federal agencies and with the general public. The purpose of these meetings was to notify the public of the proposed withdrawal and to solicit input on issues of concern that should be addressed in the forthcoming environmental review process.

TABLE A-1
WITHDRAWAL PROPOSAL HISTORY

Date	Action
1954	Navy transfers approximately 500,000 acres to BLM
1981-1982	Range Air Installation Compatible Use Zone Study
1982	Application for land withdrawal
1982	Public notification and scoping meetings
1984	Publication of Draft EIS
1985-1987	Agency and public review and comment
1986-1987	Clarification of proposed land withdrawal
1987	Public notification and scoping for Supplemental EIS (SEIS)
1988	Preparation of an Administrative Draft SEIS
1989-1990	Off-range ordnance surveys
1990	Increase of proposed land withdrawal area
1991	Preparation of Draft SEIS
1993	NAS Fallon Ranges Hazard Analysis Mitigation Report
1994	Changes in training operations
1995	Stopped preparation of SEIS, published Notice of Intent for DEIS
1995	Conducted public involvement and started preparation of DEIS
1997	Finished preparation of DEIS

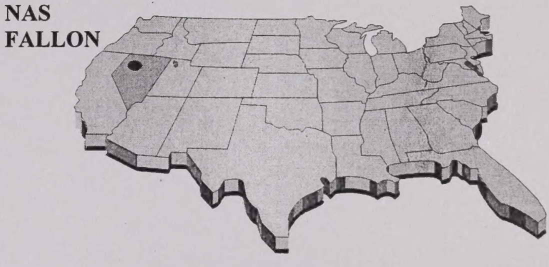
In late 1984, a Draft EIS was published for the purposes of clearly defining the proposed action and the purpose of the action and identifying and describing what appeared to be the major environmental implications of the proposed withdrawal. The document was not finalized.

In 1987, in an effort to begin addressing these concerns, the Navy provided formal public notification of its intent to prepare an SEIS and solicited scoping comments. An SEIS is prepared, under NEPA guidelines, when substantial changes are made in the proposed action or when significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts becomes available. The 1987 analysis focused on the environmental topics determined through scoping to be of greatest concern to the public, in keeping with 40 CFR 1501.7(a)(3).

In 1989 and 1990, the Navy conducted on-ground surveys to locate ordnance outside the B-16, B-17, and B-19 boundaries. Based on the findings of those surveys, approximately 7,750 acres were added to the originally proposed withdrawal lands, in order to protect the public from potential exposure to off-range ordnance. The proposed withdrawal was then increased to approximately 189,073 acres.

In 1994, the Navy proposed changes in the military training routes (MTR) associated with NAS Fallon ranges (U.S. Navy 1995d). In 1996 the final approach of all MTRs were moved from the B-16 range to the B-20 range, reducing the noise and safety impacts on areas around B-16. This realignment decreased the amount of land needed around B-16 as a safety and noise buffer. Similarly, recent changes in training operations at B-19 and the Dixie Valley area also reduced the required buffer areas around those sites. These operational changes, however, restricted training activities by reducing the diversity of training exercises and capacity of the FRTC.

Due to operational changes and the over ten year time gap from the original Draft EIS and scoping process, the Navy dropped the SEIS in 1995 and prepared this DEIS. A notice of intent was published in the Federal Register and local papers. In addition, a formal scoping process was conducted and results were incorporated into this document as discussed in Section 1.5. Original data from the 1982 EIS effort has been used and updated for this report.



APPENDIX B

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APPENDIX B DISTRIBUTION LIST

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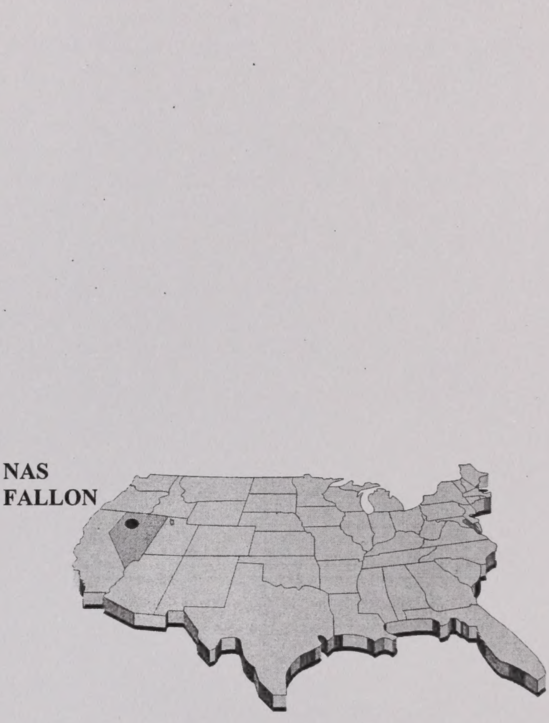


APPENDIX C

SUMMARY OF RAICUZ METHODOLOGY

APPENDIX C SUMMARY OF RAICUZ METHODOLOGY

A Range Air Installation Compatible Use Zone study provides detailed analysis of safety and noise zones around training ranges. This appendix consists of a brief description of the RAICUZ process.

The RAICUZ process uses a computer model to map noise volumes around the ranges. This mapping is based on specific data from each range, including aircraft flight paths and intended training syllabi (i.e., aircraft altitudes, speeds, attitudes, use of afterburners, turning points for each aircraft type), mix of aircraft types, and proportion of range use by each type. Noise Zones (NZ) are checked against field measurements of noise and then plotted on regional maps, showing noise contours with average annual values ranging from NZ1 (below 60 dBA) to NZ3 (above 75 dBA).

Range Safety Zones (RSZ) are similarly mapped for each range. Data used in the model includes flight paths, altitudes, location of arming points for ordnance, and locations of targets on each range. Three RSZs are defined for each range: RSZ A, ordnance impact areas, are extremely hazardous; RSZ B, areas of armed overflight, are of intermediate hazard; and RSZ C, range approaches without armed ordnance, are least hazardous.

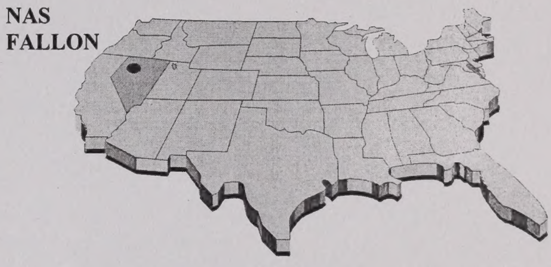
Concurrently, existing land use patterns in the vicinity of the ranges are defined on the basis of maps, aerial photos, field reconnaissance, and input from military and civilian personnel familiar with the area.

Land use compatibility within the noise zones is then evaluated by comparing noise contour maps with data on existing land uses. Evaluation of compatibility is based on DOD planning criteria regarding suitability of noise levels with surface uses, such as would be associated with schools, residences, industries, agricultural activities, and recreational uses.

Land use suitability for the defined RSZs is further evaluated by comparing information on local land use patterns with DOD guidelines for compatibility of land uses in Accident Potential Zones and modified to apply to the large areas of low-altitude overflight found in the range setting. The modeling is refined by overlaying a noise zone map on the safety zone maps to define twelve RAICUZ subzones. Land use suitability is evaluated relative to each subzone.

The resulting definitions of land use suitability are refined through input from planners and real estate experts; aviators, instructors, air traffic officers, and range officers; and representatives of federal, state, and local government agencies. These representatives are familiar with the following subjects: the

Navy's aircrew training programs, airfield and range operations, aircraft maneuverability, accident histories and statistics, local land use (e.g., minerals exploration, mining, grazing), land development trends and pressures, local patterns of land ownership and control, land management programs administered by government agencies, and Churchill County General Plan and zoning provisions.



APPENDIX D

SUMMARY OF HAZARD MITIGATION REPORT

APPENDIX D SUMMARY OF HAZARD MITIGATION REPORT

The Naval Air Station Fallon Ranges Hazard Analysis Mitigation Report, as amended September 1995, used the HAZARD methodology to identify the land area around the targets necessary to contain ordnance employed in training (US Navy 1995g). Unlike the RAICUZ study that covered noise and safety associated with range operations, the HAZARD analysis examines effects of ordnance drops only (RSZ A).

The HAZARD methodology develops safety footprints showing the total area needed to contain potential off-range ordnance for that range based on current operations. The analysis accounts for specific aircraft, ordnance, and delivery parameters (including dive angle, release altitude, and airspeed), terrain, and how ordnance enters the range relative to the targets. The range composite weapons safety footprint is developed by combining the footprints for each specific operation that takes place at each target.

This appendix provides the June 1994 Executive Summary of the HAZARD report and the September 1995 Addendum. The addendum is presented first because it provides the most up to date safety footprints. This information was used in developing the withdrawal footprints. The June 1994 Executive Summary is provided as background information on the HAZARD report and methodology. The figures showing the safety footprints are not included because they did not adequately reflect the operations at the ranges and were superseded by the 1995 analysis as presented in the addendum.

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PURPOSE.

This Addendum to the Executive Summary of 29 June 1994 presents the revised composite footprints for the NAS Fallon Ranges B-17, B-19 and B-20 that result from changes in operational procedures adopted by the Department of the Navy. These footprints are a culmination of several stages of comprehensive analysis of the Fallon Range Training Complex (FRTC). The operational changes resulting from this extensive analysis are incorporated in the Fallon Range Users Manual (NAFINST 3752.1F), dated 30 November 1994.

BACKGROUND.

The analyses have been concerned with air-to-ground training operations resulting in ordnance delivery at each target. An initial composite footprint for each range, representing all operations conducted on each target at that point in time, was developed to show the result of desired operations. The earliest work identified weapon safety footprints that had a potential to extend beyond range boundaries. Subsequent analyses have addressed how operational procedures affect the footprints, how terrain affects the footprints, and how mitigation alternatives affect the footprints. The analysis presented in this addendum has taken into account all available data from previous analyses.

A weapon safety footprint is a two-dimensional representation of the ground area where weapon impacts may occur (including ricochet) for a specified weapon delivery event. Weapon safety footprints are unlike Circular Error Average or Circular Error Probability analyses. Those are typically performed to determine how good average scores are or how many weapons are needed to assure target destruction. Weapon safety footprints address the other side of the coin. The key word is *safety*. They are developed to account for the weapon impacts that represent the worst case, in terms of distance from the target, that may occur during training operations. This type of information is necessary to intelligently plan for many issues, such as where to place targets relative to range boundaries, where manned sites or high value assets should (or should not) be located, and the types of activity (such as other land use) that may be compatible with certain parts of the range. Footprints are developed using observed data collected over time from as many ranges as possible, representing the variety of pilot training levels and aircraft systems performance. When external mitigating factors are present, such as significant vertical terrain, further analysis is possible to determine the effect on weapon behavior, such as ricochet. The footprints comprise one of the databases of the HAZARD Program, which was developed to assist planners in performing the Hazard Methodology process. The Hazard Methodology is a step-by-step process to address safety issues associated with air-to-ground weapon delivery events. Among other things, it assists in decision making about compatible land uses, range design and layout, mitigation of hazards, and risk assessment.

The Hazard Methodology is the method endorsed by the Chief of Naval Operations for defining land area requirements to support FRTC operations. This proven methodology has also been used and refined for many years by other components of the Department of Defense. It has been instrumental in compliance with the National Environmental Policy

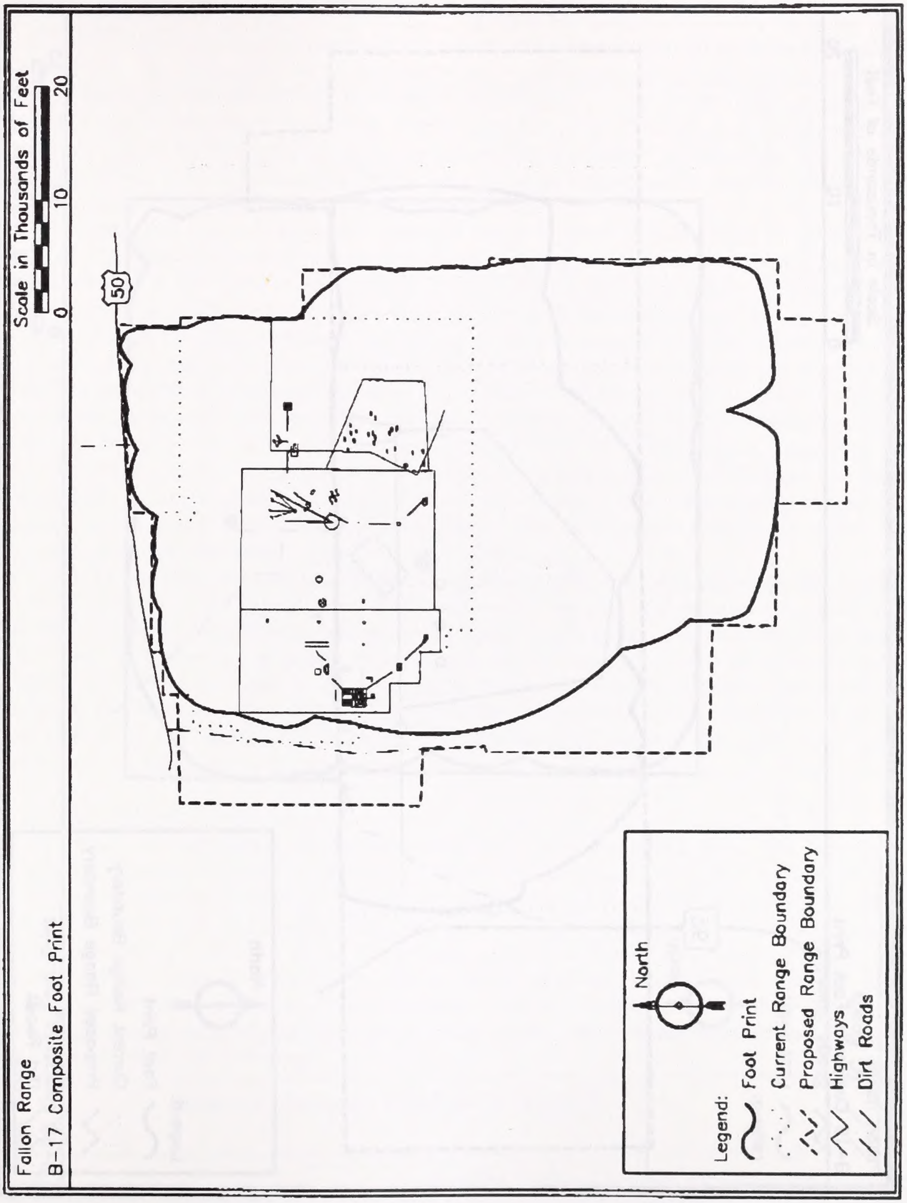
Act process and, due to the high level of confidence to which the model is designed, has been accepted in public and political forums.

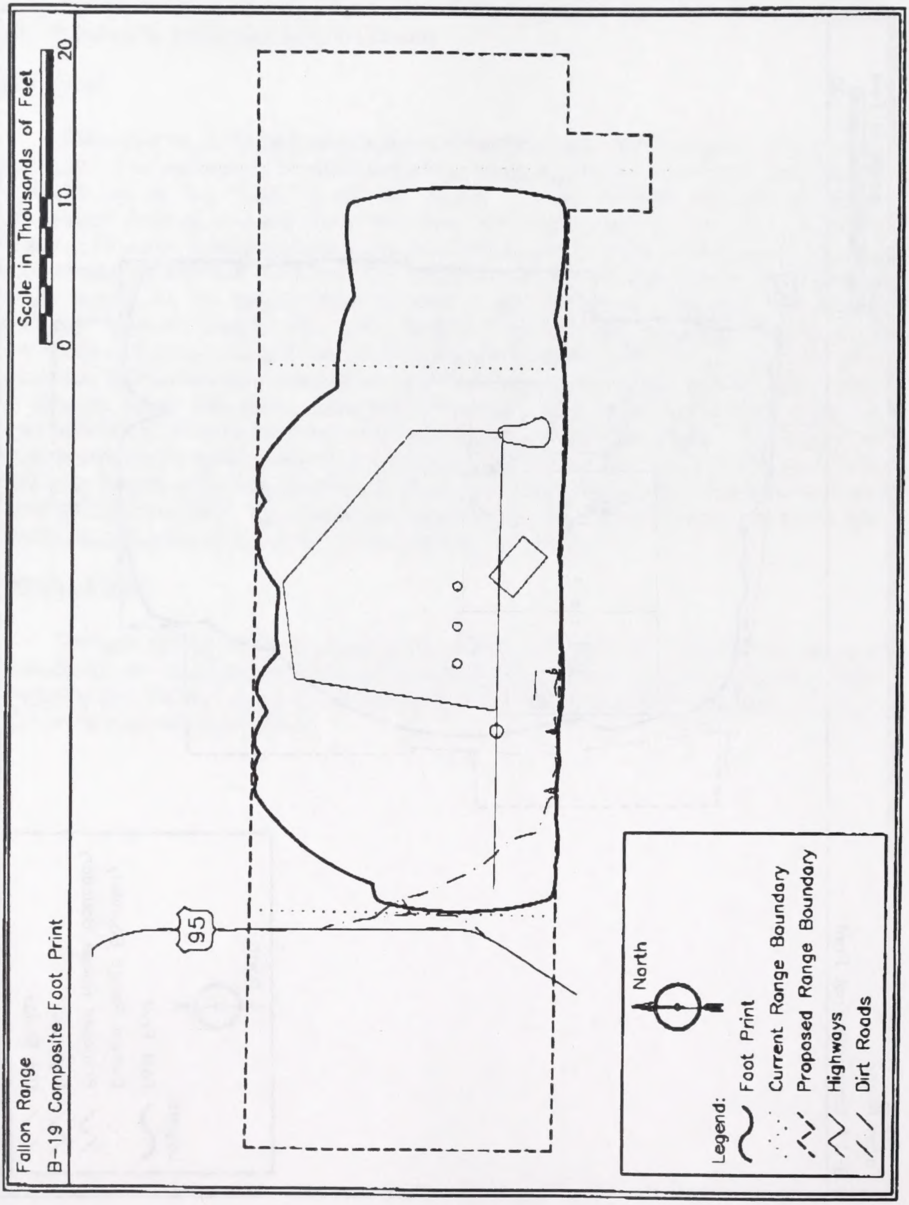
ANALYSIS.

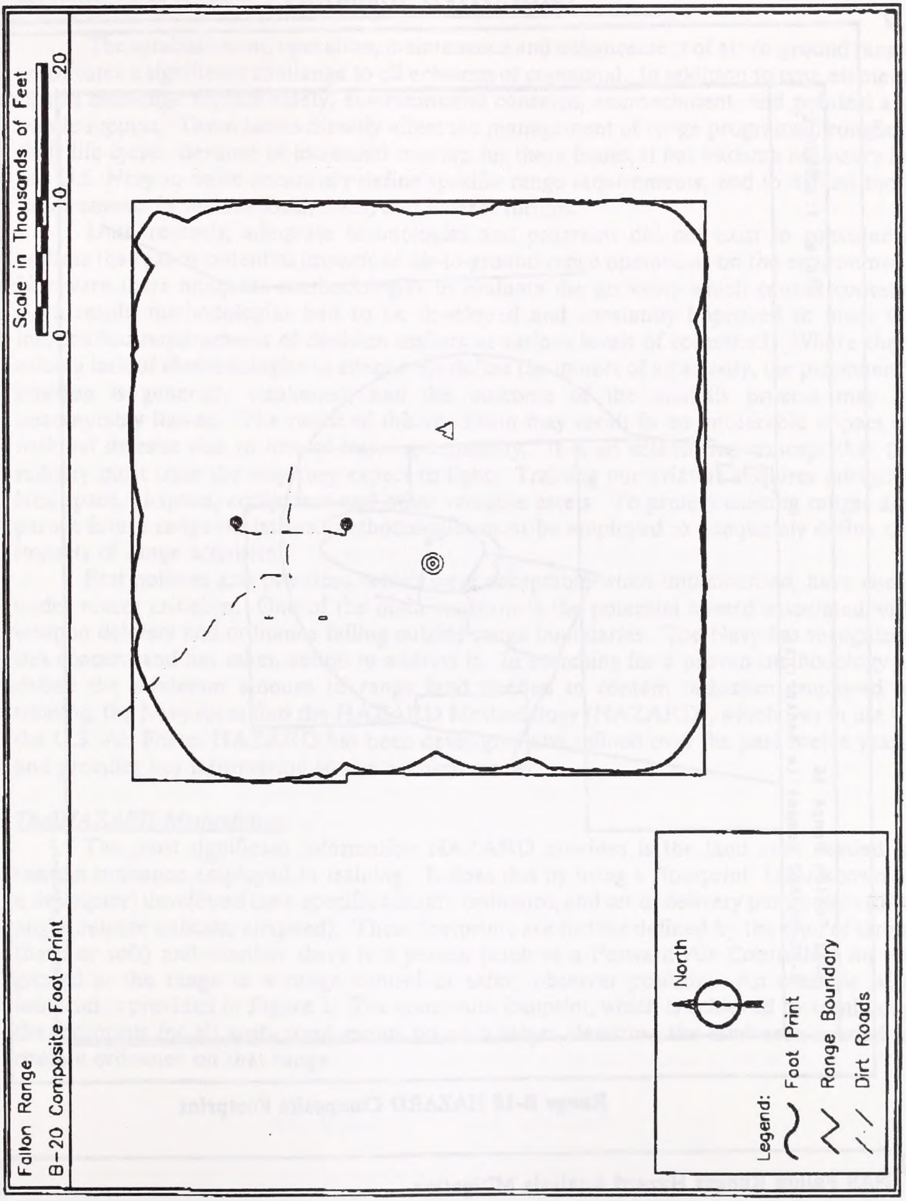
Development of the revised composite footprints began with a review of the changes implemented in operations for each individual range and target, as well as the changes applicable across the board to all the ranges. Earlier analysis had identified the employment limitations using footprints from the Department of the Navy footprint database. In order to avoid unnecessary restrictions, a more in-depth analysis was conducted to determine the effect of terrain on the footprints. Some footprints are totally mitigated by the terrain on the range, where ricochet is minimized or eliminated, and by the "backstop" effect of rising terrain. Other footprints are partially mitigated, which resulted in revised restrictions. Using these restrictions and the analyses performed earlier, the final operational restrictions were selected and implemented. For the range composite footprints, all weapon safety footprints authorized for each target were applied according to implemented restrictions, forming a composite footprint for each *target*. The individual target composite footprints were then combined to form a *range* composite footprint. The composite footprints for Ranges B-17, B-19, and B-20 are presented on Addendum Pages 3 through 5, respectively. The composite footprints indicate the areas where ordnance may impact, including ricochet, during routine training operations.

CONCLUSION.

The operational restrictions implemented by the U.S. Navy at the FRTC are effective in confining the weapon safety footprints within the proposed range boundaries. The restrictions provide for maximum training flexibility, given the size and shape of each range, while promoting safe operations.


Fallon Range
B-17 Composite Foot Print
Scale in Thousands of Feet
0
10
20
50
North
Legend:
Foot Print
Current Range Boundary
Proposed Range Boundary
Highways
Dirt Roads


Fallon Range
B-19 Composite Foot Print
Scale in Thousands of Feet
0
10
20
95
North
Legend:
Foot Print
Current Range Boundary
Proposed Range Boundary
Highways
Dirt Roads


Fallon Range
B-20 Composite Foot Print
Scale in Thousands of Feet
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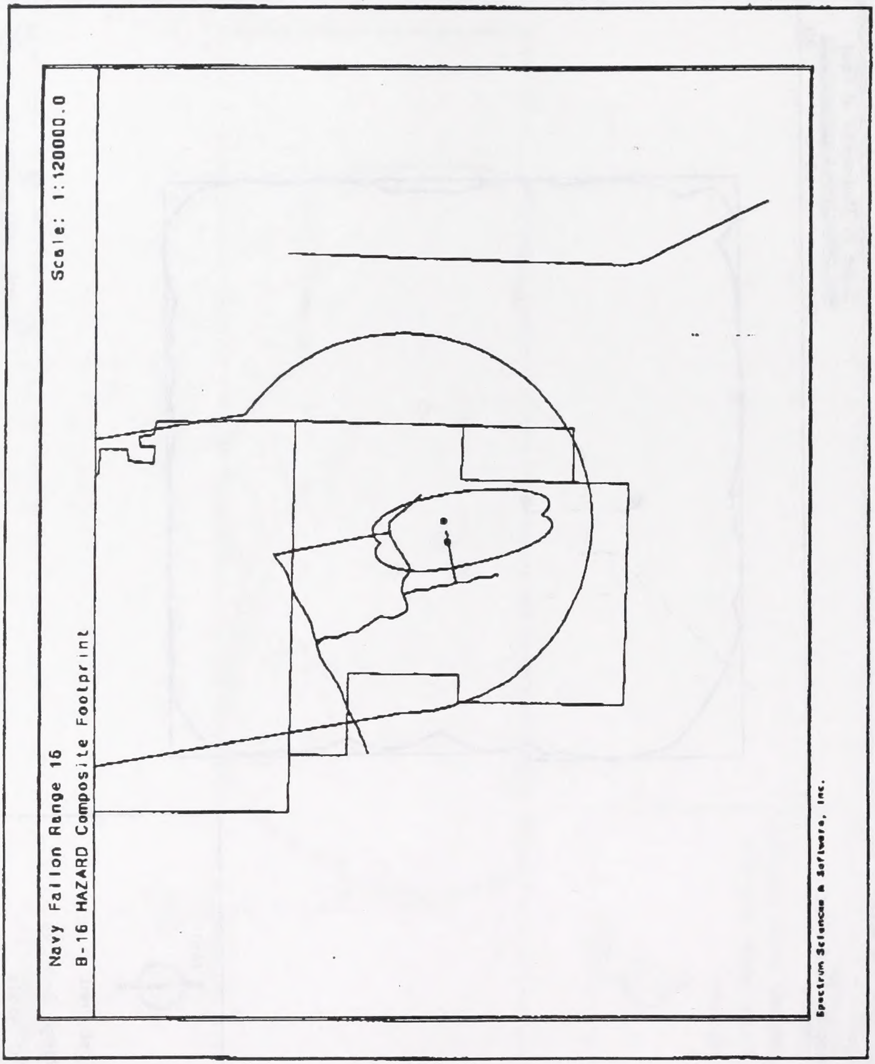
10
20
North
Legend:
Foot Print
Range Boundary
Dirt Roads


Navy Fallon Range 16
B-16 HAZARD Composite Footprint
Scale: 1:120000.0
Spectrum Sciences & Software, Inc.

Range B-16 HAZARD Composite Footprint

INTRODUCTION AND BACKGROUND.

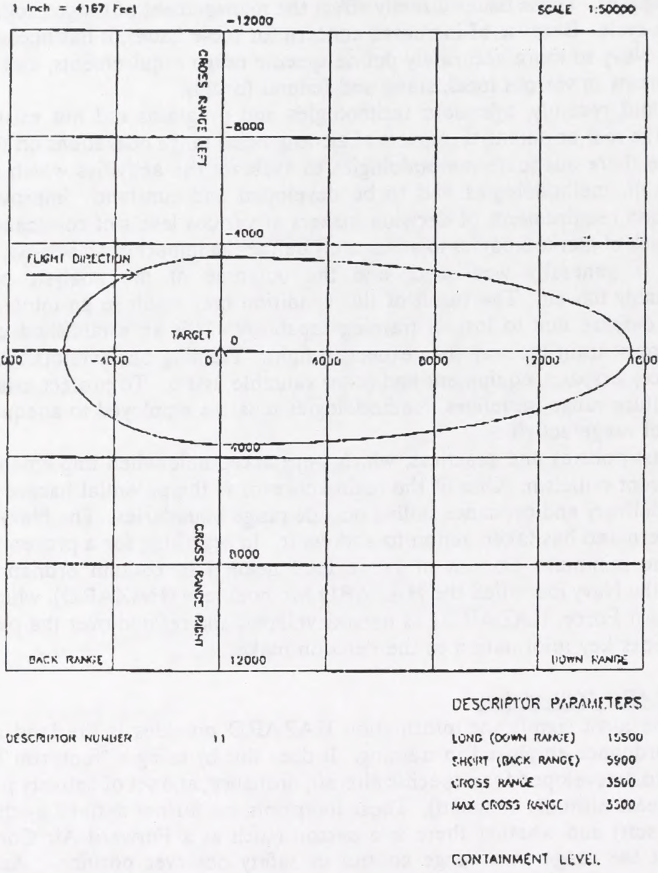
The establishment, operation, maintenance and enhancement of air-to-ground ranges constitutes a significant challenge to all echelons of command. In addition to cost, elements of this challenge include safety, environmental concerns, encroachment, and political and public support. These issues directly affect the management of range programs throughout their life cycle. Because of increased concern for these issues, it has become necessary for the U.S. Navy to more accurately define specific range requirements, and to defend those requirements in various local, state, and federal forums.

Until recently, adequate technologies and programs did not exist to consistently address the real or potential impacts of air-to-ground range operations on the environment. Nor were there adequate methodologies to evaluate the activities which caused concern. As a result, methodologies had to be developed and constantly improved to meet the information requirements of decision makers at various levels of command. Where there exists a lack of methodologies to adequately define the impact of an activity, the proponent's position is generally weakened, and the outcome of the analysis process may be unacceptably flawed. The result of this condition may result in an intolerable impact on national defense due to loss of training capability. It is an established concept that the military must train the way they expect to fight. Training our aviators requires adequate land space, airspace, equipment and other valuable assets. To protect existing ranges and permit future range initiatives, methodologies must be employed to adequately define the impacts of range activities.

Past policies and practices, which were acceptable when implemented, have come under recent criticism. One of the main concerns is the potential hazard associated with weapon delivery and ordnance falling outside range boundaries. The Navy has recognized this concern and has taken action to address it. In searching for a proven methodology to define the minimum amount of range land needed to contain ordnance employed in training, the Navy identified the HAZARD Methodology (HAZARD), which was in use by the U.S. Air Force. HAZARD has been developed and refined over the past twelve years, and provides key information to the decision maker.

The HAZARD Methodology

The most significant information HAZARD provides is the land area needed to contain ordnance employed in training. It does this by using a "footprint" (also known as a descriptor) developed for a specific aircraft, ordnance, and set of delivery parameters (dive angle, release altitude, airspeed). These footprints are further defined by the type of target (hard or soft) and whether there is a person (such as a Forward Air Controller) on the ground at the range in a range control or safety observer position. An example of a footprint is provided in Figure 1. The composite footprint, which is achieved by combining the footprints for all authorized events on each target, describes the land area needed to contain ordnance on that range.



DESCRIPTOR PARAMETERS

DESCRIPTOR NUMBER	11
LONG (DOWN RANGE)	15500
SHORT (BACK RANGE)	5900
CROSS RANGE	3500
MAX CROSS RANGE	3500

CONTAINMENT LEVEL

99.99 Percent

CONFIDENCE LEVEL

95.00 Percent

Figure 1. Example of a Footprint

Another key piece of information provided by HAZARD is the probability of ordnance impact at any location within the footprint, based on a specified number of times that event is performed. Therefore, areas of critical concern (ACC) can be assessed for the hazard of ordnance impact. ACCs may include such things as manned positions, scoring towers, high value equipment, explosive ordnance disposal areas, etc. Manned positions and high value assets can be placed/constructed with prior knowledge of the risk involved.

A footprint is developed from a database of observed weapon impacts. These impacts were observed during training at various manned Air Force ranges. In addition to the impacts that were scored, a special effort was made to estimate and include the impact points of ordnance that were unscoreable due to early/late release, pilots not achieving delivery parameters, aircraft system malfunctions, and ordnance malfunctions. These impacts that are typically not scored are essential in defining a footprint. From the observed initial impact data, a ricochet trajectory is modeled to determine the subsequent ricochet impact point. The footprints are then statistically developed to contain 99.99% of all initial and ricochet impacts at the 95% confidence interval. These footprints are developed with the assumption that the terrain is flat, so that the footprints can be used at any range on any target. The result is that the user can be confident that the footprints will in fact define the extent of the hazard area. Based on the statistics, the probability of an impact outside the defined footprint for any event is no more than one in ten thousand. Within the HAZARD program a probability distribution function (pdf) for each footprint is used for calculating the probability of impact within a footprint for an ACC.

It is important to note that a footprint does not represent how good pilots are- but how far ordnance may travel when something goes wrong in a training scenario. Therefore, a footprint may seem large to someone familiar with the Circular Error Probable (CEP) data in the Joint Munitions Effectiveness Manuals. That is because the CEP is only concerned with weapons impacting on or near the target, while HAZARD is concerned with all weapon impacts. However, both the CEP and the HAZARD footprint are developed using similar analysis techniques.

This methodology allows the planner and decision maker to implement or modify procedures to meet training needs with a high degree of confidence that the events will be accomplished safely. If any alternative procedure would adversely affect the quality of training, the planner would be able to document the need for other alternatives.

Navy Evaluation of HAZARD

Upon identification of the HAZARD Program, the Navy initiated a test program to determine if it was suitable for use by the Navy. The Fallon Range Training Complex (FRTC) was selected as the test location. Figure 2, taken from the current Fallon Range Users Manual, illustrates the geographic relationship between the individual ranges, NAS Fallon, and training airspace. Figures 3 thru 6, also taken from the Fallon Range Users Manual, depict the individual ranges. Since the Navy has not developed any footprints for Navy-specific training events, the Air Force footprints were used where applicable. The first

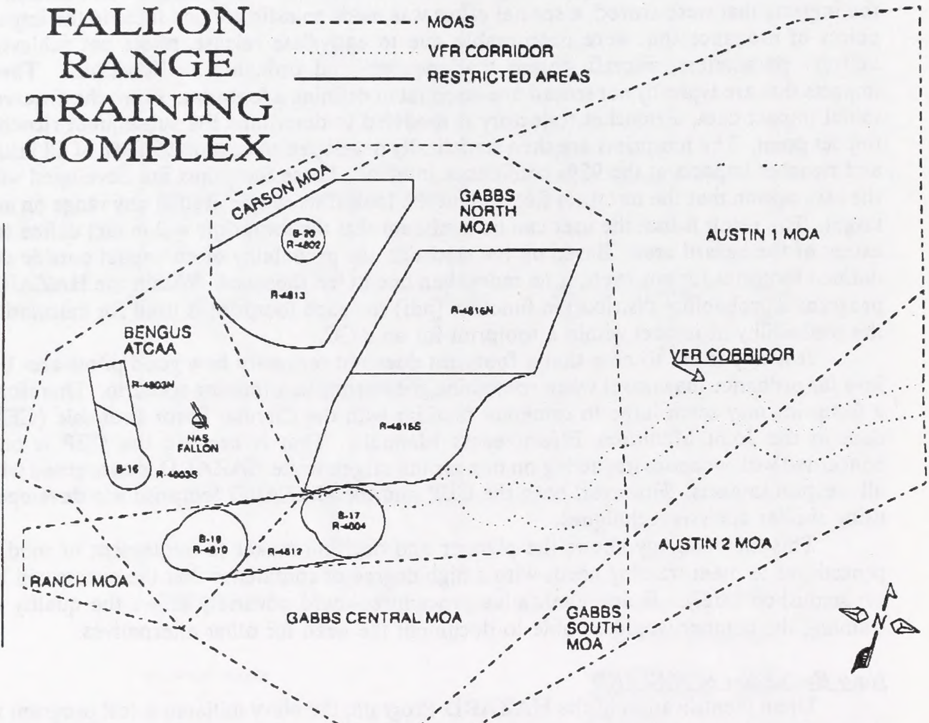


Figure 2. Overview of the FRTC

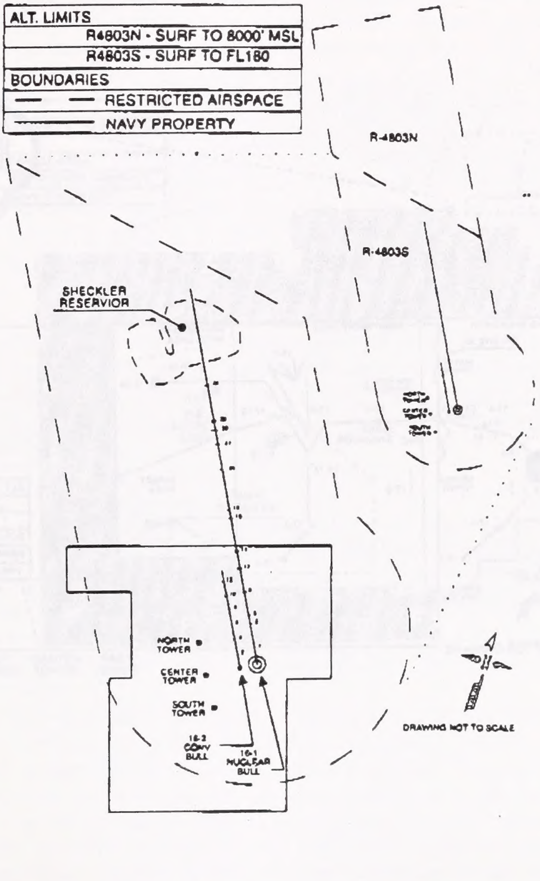


Figure 3. Range B-16

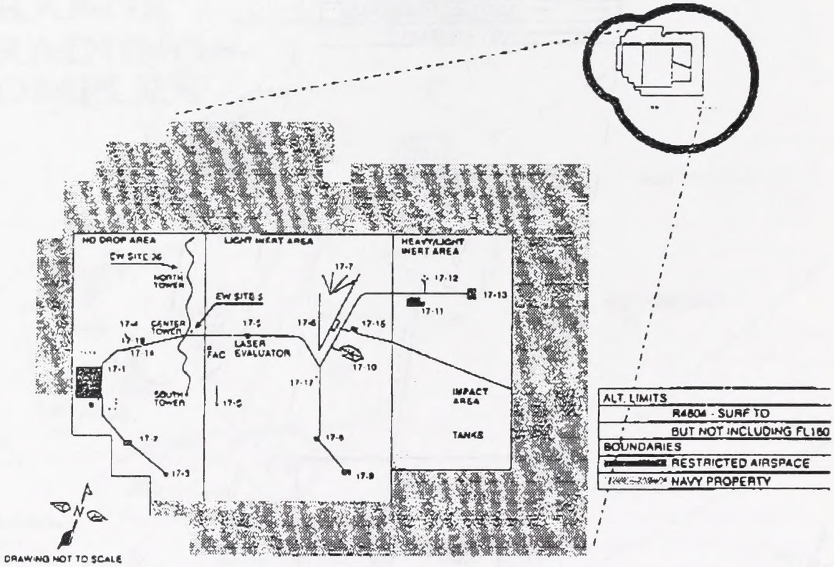


Figure 4. Range B-17

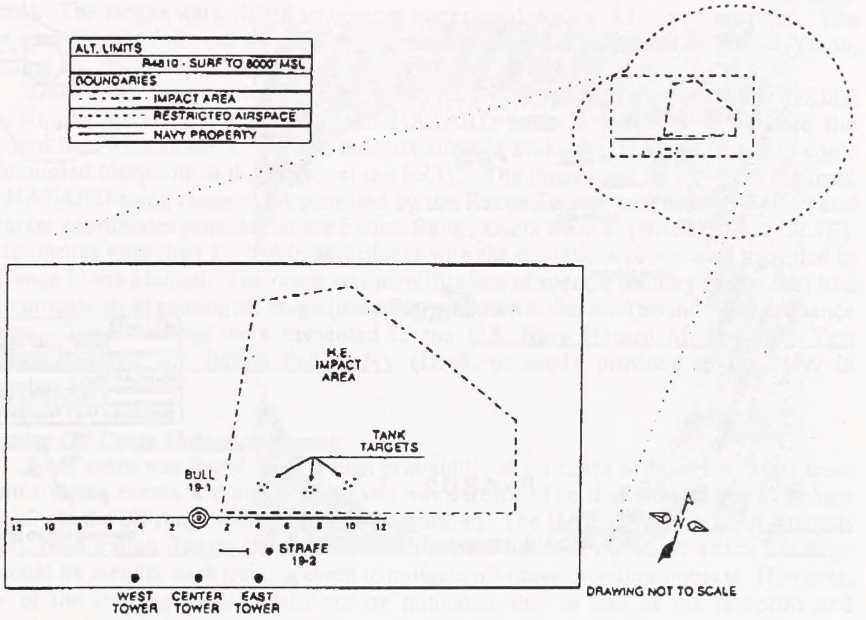


Figure 5. Range B-19

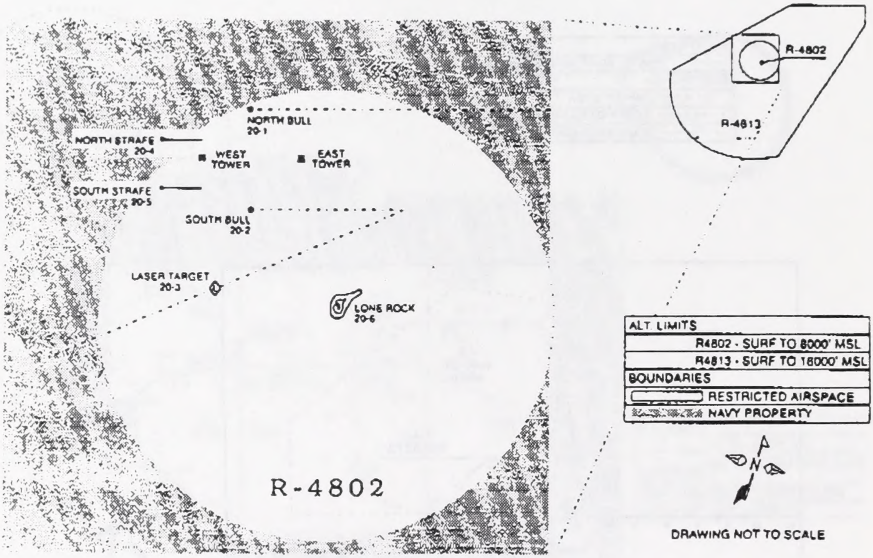


Figure 6. Range B-20

effort in the Navy's evaluation of HAZARD was the Descriptor Database Review, dated 20 March, 1991. This document provided the results of an analysis to determine how Navy/Marine aircraft, tactics, and weapons compare to their Air Force counterparts, and therefore which footprints would be applicable to Navy training operations. This analysis also considered the difference in range operations and maintenance procedures. As part of the analysis, Navy and contractor personnel visited NAS Fallon and MCAS Yuma to meet with operations personnel and range maintenance personnel. At NAS Fallon, discussions were held with the Naval Strike Warfare Center (STRIKE), Range Department personnel, and with contractor personnel that were involved with range operations and maintenance (O&M). The ranges were visited to observe target conditions and training missions. The same scenario was followed with operations and maintenance personnel at MCAS Yuma, including the range visit.

During this time, analysis of a proposed land withdrawal of approximately 188,000 acres for the FRTC was underway, and HAZARD had the potential to validate the proposed land withdrawal. Therefore, the next effort in evaluating HAZARD was to apply the identified footprints to the targets at the FRTC. The ranges and targets were digitized into HAZARD using range maps provided by the Range Department at NAS Fallon and the target coordinates provided in the Fallon Range Users Manual (NASFINST 3752.1E). The footprints were then applied in accordance with the operations procedures provided in the Range Users Manual. The result was identification of specific training events that had a high probability of causing off-range (including proposed withdrawal boundaries) ordnance impacts. These findings were presented in the U.S. Navy Hazard Methodology Test Program at Naval Air Station Fallon, NV (Draft, undated), provided to the Navy in December 1991.

Mitigating Off-Range Ordnance Impacts

Since there was found to be a high probability of off-range ordnance impacts from certain training events, a mitigation analysis was performed so that alternatives to reduce or eliminate the off-range impacts could be identified. The HAZARD Mitigation Analysis Report, NAS Fallon Ranges, June 1992, identified the limits of run-in, or attack headings that could be used for each training event to mitigate off-range ordnance impacts. However, some of the training events could not be mitigated, due to size of the footprint and allowable run-in headings.

Rather than imposing limits on run-in headings, and in effect restricting training at the FRTC, the Navy decided to perform an analysis on another possible mitigating effect: the effect of terrain on the ricochet component of the footprint. The initial weapon impact points are not dependent upon terrain, but ricochet is affected by the initial impact angle of the ordnance and by the "backstop" effect that rising terrain (hills) down-range may have. The terrain analysis involved integrating the HAZARD database into a Geographic Information System (GIS) capable of using Digital Elevation Model (DEM) data with ricochet trajectory algorithms to determine the effect of terrain elevation and slope on the ricochet. The weapon trajectory is continually compared to the terrain elevation and where the two coincide is the ricochet impact point. The product of this three-dimensional (3D) analysis is not a statistical footprint. It is a graphical representation of where the initial ordnance impacts occur based on observed data, and where the resultant ricochet impacts are calculated to occur based on proven trajectory calculations and actual terrain. The impact plots depict each initial and ricochet impact point, rather than a geometric shape bounded by a line.

During preparation of this analysis, NAS Fallon requested that new close air support (CAS) training events and procedures be included in the final report. These training events are conducted in the presence of a forward air controller (FAC) who performs as a range control/safety observer. Based on the presence of a FAC, further analysis of the Air Force controlled range footprints was conducted to determine which footprints could be modified for use by the Navy. Four footprints were modified and applied to the CAS targets on B-17. In addition, certain training events previously evaluated were identified by the operations personnel at NAS Fallon as not applicable to current training scenarios. They include events no longer performed, such as loft deliveries and some special weapons deliveries. These events were eliminated from further consideration. Operations personnel further indicated that attacks are not generally made from behind the high terrain on Ranges B-17 and B-19. Thus, run-in headings from those general directions were eliminated from further analysis. The remaining training events and run-in headings were analyzed for the mitigating effect of terrain on ricochet impacts, and to develop the composite weapons impact areas based on these current operating procedures. This work is presented in the attached document titled NAS Fallon Ranges Hazard Analysis Mitigation Report, Volume 2 (Including Terrain), dated 15 October 1993. Also, for this summary, the HAZARD composite footprints were revised to reflect the new conditions. These are presented in Figures 7 thru 10.

The graphics in figures 7 through 10 depict plots generated for each range, using the HAZARD Program, showing the new composite footprint that resulted from the operational changes incorporated into this analysis. These plots do not include legends, because HAZARD does not produce one. Instead, it permits a title line for pertinent data. The title line on these plots is used to specify the range and the footprint. Figures 11 and 12 are comprised of the current and proposed withdrawal boundaries with an overlay illustrating the mitigating effect of terrain on off-range impacts for ranges B-17 and B-19. Initial and ricochet impact points from the 3D analysis are plotted along with the composite footprint from HAZARD. The 3D impact points are depicted by small diamond shapes that are either white for initial impact, or black for ricochet impact. The composite footprints from HAZARD are labeled as the 2D HAZARD impact area and are represented by the bounded, shaded area. Range B-16 has no off-range impacts resulting from training events accomplished there, and B-20 has no significant terrain to mitigate ricochet. Therefore, terrain mitigation analysis was not requested for those ranges.

CONCLUSIONS.

The mitigating effect of terrain on B-17 and B-19 is significant, as expected. There remains some off-range impact potential, so other mitigating actions may need to be considered. These could include restricting run-in headings, moving targets, prohibiting certain training events on some ranges, and/or other actions. Another alternative, if none of those are acceptable for critical training events, is to withdraw additional land beyond the proposed 188,000 acres to support the FRTC.

If additional land is withdrawn to incorporate off-range impact areas at B-17 and B-19, approximately 20,300 total additional acres will be needed, including 9,700 acres for B-17 and 10,600 acres for B-19. These acreage figures are estimated by bounding all off-range impacts with straight lines, so that land might be withdrawn by sections. A survey, based on a logical withdrawal by land parcel, would provide a precise number of acres.

ENDORSEMENT BY NAS FALLON.

In lieu of withdrawing an additional 20,300 acres to support FRTC, NAS Fallon has identified operational restrictions to mitigate any off-range impact potential. These specific mission requirements, as identified in Figure 13, will be included in NASFINST 3752.1E, the Fallon Range Users Manual. Therefore, additional land withdrawal is not required for those missions addressed in this report.

NAS FALLON AIRCRAFT PROFILE RESTRICTIONS

Tgts	Run-in Heading (Mag)	Weapon Type	Dive/ Climb Angle	Release Altitude (FT AGL)	Release Speed (KTAS)	Aircraft (Type)
17-7	356-026	MK-106	+20 to +65	200-9000	300-500	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
17-11	346-166	MK-82LGB MK-84LGB	0 to -5	200-5000	340-720	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-166	MK-82LGB MK-84LGB	-5 to -45	200-5000	300-650	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	0 to -25	5K-10K	357-668	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-25 to -70	5K-10K	350-980	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	0 to -5	10K-30K	365-784	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-5 to -70	10K-30K	420-774	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
17-12	346-166	MK-82LGB MK-84LGB	0 to -5	200-5000	340-720	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-5 to -45	200-5000	300-650	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	0 to -25	5K-10K	357-668	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-166	MK-82LGB MK-84LGB	-25 to -70	5K-10K	350-980	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	0 to -5	10K-30K	365-784	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-5 to -70	10K-30K	420-774	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14

Figure 13. NAS Fallon Aircraft Profile Restrictions

Tgts	Run-in Heading (Mag)	Weapon Type	Dive/ Climb Angle	Release Altitude (FT AGL)	Release Speed (KTAS)	Aircraft (Type)
17-13	346-166	MK-82LGB MK-84LGB	-40 to +20	1K-11K	400-600	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	026-166	MK-106	+20 to +65	200-9000	300-500	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	0 to -5	200-5000	340-720	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-5 to -45	200-5000	300-650	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	0 to -25	5K-10K	357-668	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-25 to -70	5K-10K	350-980	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	0 to -5	10K-30K	365-784	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-5 to -70	10K-30K	420-774	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
B-17 IMPACT AREA	026-236	MK-82LGB MK-84LGB	0 to -5	200-5000	340-720	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-5 to -45	200-5000	300-650	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	0 to -25	5K-10K	357-668	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-25 to -70	5K-10K	350-980	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	0 to -5	10K-30K	365-784	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	346-236	MK-82LGB MK-84LGB	-5 to -70	10K-30K	420-774	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14

Figure 13, Continued.

Tgts	Run-in Heading (Mag)	Weapon Type	Dive/ Climb Angle	Release Altitude (FT AGL)	Release Speed (KTAS)	Aircraft (Type)
B-19 IMPACT AREA	016-106	GP BOMBS	-45 to +20	1K-10K	300-600	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	016-106	GP BOMBS	-5 to +5	100-2000	300-700	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	036-108	MK-82LGB MK-84LGB	-40 to +20	1K-11K	400-600	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	036-108	MK-82LGB MK-84LGB	0 to -5	200-5000	340-720	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	036-108	MK-82LGB MK-84LGB	-5 to -45	200-5000	300-650	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	036-108	MK-82LGB MK-84LGB	0 to -25	5K-10K	357-668	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	036-108	MK-82LGB MK-84LGB	0 to -5	10K-30K	365-784	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	036-108	MK-82LGB MK-84LGB	-5 to -70	10K-30K	420-774	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
20-3 LGB TGT	053-083	MK-82LGB MK-84LGB	-5 to -45	200-5000	300-650	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	053-083	MK-82LGB MK-84LGB	0 to -25	5K-10K	357-668	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	053-083	MK-82LGB MK-84LGB	0 to -5	10K-30K	365-784	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	053-083	MK-82LGB MK-84LGB	-5 to -70	10K-30K	420-774	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14

Figure 13, Continued.

Tgts	Run-in Heading (Mag)	Weapon Type	Dive/ Climb Angle	Release Altitude (FT AGL)	Release Speed (KTAS)	Aircraft (Type)
20-3 LGB TGT	233-263	MK-82LGB MK-84LGB	0 to -5	200-5000	340-720	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	233-263	MK-82LGB MK-84LGB	-5 to -45	200-5000	300-650	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	233-263	MK-82LGB MK-84LGB	0 to -25	5K-10K	357-668	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	233-263	MK-82LGB MK-84LGB	0 to -5	10K-30K	365-784	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	233-263	MK-82LGB MK-84LGB	-5 to -70	10K-30K	420-774	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
B-20 IMPACT ARE	000-359	MK-82LGB MK-84LGB	0 to +70	100-10K	250-650	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	061-241	MK-82LGB MK-84LGB	0 to -5	200-5000	340-720	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	331-241	MK-82LGB MK-84LGB	-5 to -45	200-5000	300-650	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	000-359	MK-82LGB MK-84LGB	0 to -25	5K-10K	357-668	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	061-151	MK-82LGB MK-84LGB	-25 to -70	5K-10K	350-980	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	000-359	MK-82LGB MK-84LGB	0 to -5	10K-30K	365-784	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14
	000-359	MK-82LGB MK-84LGB	-5 to -70	10K-30K	420-774	TA-4/A-6/A-7/F-4 FA-18/T-45/AV-8B/F-14

Figure 13, Continued.

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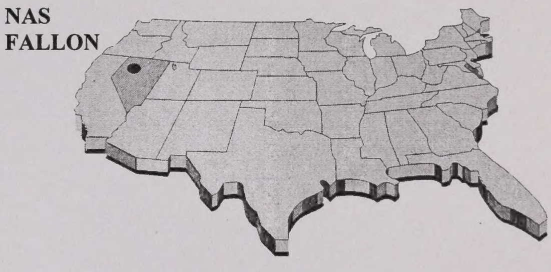

APPENDIX E

B-16 RAICUZ AND NOISE STUDY

APPENDIX E B-16 RAICUZ AND NOISE STUDY

This appendix includes the Executive Summary from the *Final Range Air Installation Compatible Use Zone (RAICUZ) Study for B-16*, released in 1997, and the *Aircraft Noise Study for the Proposed B-16 Range Complex, Naval Air Station Fallon, Nevada*, released in 1996.

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NAVAL AIR STATION FALLON, NEVADA

RANGE B-16

RANGE AICUZ UPDATE - 1997

Engineering Field Activity West
Naval Facilities Engineering Command

February 1997

1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION

This report describes the findings of the Range Air Installation Compatible Use Zone (RAICUZ) program update for Naval Air Station (NAS) Fallon Training Range Bravo 16 (Range B-16). This RAICUZ Update is based on a new Noise Study (completed May 1996) and development of new Range Safety Zones. Since the previous RAICUZ study at Range B-16 was conducted in 1982, a number of factors have occurred that have made updating the Range B-16 RAICUZ imperative to NAS Fallon, including:

- New Aircraft—The performance characteristics of different aircraft, as well as new operational procedures at Range B-16, resulted in changes in RAICUZ determination.
- Changes in Department of Defense (DOD) Land Use Compatibility Guidelines—OPNAVINST 11010.36A expanded and clarified the land use guidelines used in 1982.
- Establishment of Department of Navy Range Planning Program and interim range planning guidelines.
- Proposed alteration of Restricted Airspace in the vicinity of Range B-16.
- Alteration in flight tracks and changes in flight track utilization—In 1982, aircraft operations and flight tracks originated north of Range B-16, but now originate south of the range.
- Development of the area near Range B-16—New subdivision of land and residential development has taken place in the vicinity of the range since 1982.

This RAICUZ Update has been prepared under the directives of the DOD that established the Air Installation Compatible Use Zone (AICUZ) program to investigate the problems of urbanization and associated encroachment on military installations and to formulate courses of action which would encourage harmonious land uses in these areas. The RAICUZ program uses AICUZ criteria and interim range planning guidelines for describing impacts related to aerial weapons training ranges.

The AICUZ and RAICUZ programs, by providing tools to promote compatible development around military installations, has the following objectives:

- protect the health, safety, and welfare of civilian and military personnel by discouraging land development that is incompatible with aircraft operations
- protect the Navy investments in air installations and ranges and maintenance of operational capabilities of these installations and ranges
- provide development guidelines and programs for the use of planning jurisdictions in the vicinity of the airfield and facilitate the resolution of land use incompatibilities adjacent to the boundaries of military installations and ranges

- inform the general public about the Navy AICUZ and RAICUZ programs to minimize noise impacts and aircraft accident potential near military air installations and ranges

1.2 MISSION AND OPERATION LEVELS

Training Range B-16 is part of the NAS Fallon Range Training Complex (FRTC). The FRTC primarily serves as a bombing and air warfare training center for Navy and Marine Corps air bases in the western United States and consists of several Military Operating Areas (MOAs) and Air Traffic Control Assigned Airspace. Range B-16 is used for practice in the basic techniques of air-to-ground bombing including special weapons delivery and conventional bombing using inert/training ordnance.

Daily range utilization data were collected over a 12-month period in 1994, representing existing conditions at Range B-16. This information included date, number and types of aircraft, scheduled and actual times on the range, number and types of ordnance, and if the flight was scored, the type of maneuver. Using these assumptions, a total of 10,898 operations were counted and used to represent current conditions.

The types of maneuvers performed at Range B-16 include High Dive, Low Dive, High Pop-Ups, Low Pop-Ups, Radar, and Lay-down. The most common aircraft type utilizing Range B-16 is the F/A-18, which conducted 89 percent of the total operations. Other aircraft utilizing the range include the A-6 Intruder, EA-6B Prowler, S-3 Viking, F-14 Tomcat, A-10 Thunderbolt, F-15 Eagle, and the E/F-111 Raven.

1.3 RAICUZ METHODOLOGY

Criteria and guidelines for the Range B-16 RAICUZ were supplied by standard AICUZ references with some adaptations as indicated. A training range complex differs from an airfield in the nature of flight operations. Range flight operations, such as high-speed and low-altitude maneuvers, and ordnance delivery, demand a different emphasis on safety than airfield flight training. Sound levels generated on the range may be typically high in decibels, but brief in duration, unlike the longer-term and more repetitive sound events at air stations. Standards for airfield land use compatibility, therefore, are adjusted to meet the specific character of range operations. The general methodology of the study, however, follows the guidelines established for AICUZ studies. The RAICUZ development process considers areas of noise impacts and safety consideration represented by noise-level contours and range safety zones.

Standard computer modeling techniques were used as the basis for the noise assessment (Wyle 1996). The noise metric used in the noise analysis performed at Range B-16 is the day-night average sound level L_{dn}, or DNL. The day-night average metric accounts for the heightened intrusiveness of noise events occurring during the nighttime (defined as 2200 to 0700) by penalizing nighttime events as if they were equal to 10 daytime events. For the development of noise contours, these total operations were then split into the number of operations on an "average busy day" over a period of one year. An average busy day occurs when any day's total operations are at least 50 percent of the annual average daily operations (total operations divided by 365 days). Noise levels are represented by contour lines and are derived from the combination of the flight patterns and operation level information.

The results of the study were used to produce three zones of averaged noise levels: Noise Zone 1 (less than 65 L_{dn}); Noise Zone 2 (65 to 75 L_{dn}); and Noise Zone 3 (greater than 75 L_{dn}). The number and location of noise complaints attributed to Range B-16 operations are considered in an effort to validate the impact of air operations on the surrounding communities. During the years 1993, 1994, and 1995, approximately 120 complaints about aircraft noise were received at NAS Fallon.

In addition to noise, the other major element in the RAICUZ development process is the consideration of safety. Safety zones are developed in response to consideration for safety of flight and persons on the ground relative to the locations of dropped ordnance, arming weapons systems, and airspace for aircraft maneuvering. For Range B-16, RSZs were established based on interim guidance from the Department of the Navy's Range Planning Office. Three Range Safety Zones (RSZs) were developed. The RSZ A, is centered on the targets and represents the weapons impact area. The Navy's HAZARD methodology was used to evaluate impact areas based on aircraft tactics and ordnance delivery parameters. RSZ B is the area of armed overflight, and RSZ C is the minimum restricted airspace required for aircraft to maneuver on the range.

RAICUZ subzones are developed by combining Noise Zones with RSZs. The noise contours and the RSZs are superimposed, resulting in the potential for up to nine RAICUZ subzones. RAICUZ subzones apply to specific areas of land and describe impacts upon those lands from environmental noise and safety hazards related to military aviation activity. The suitability of land uses within these RAICUZ areas requires special attention by federal, state, and local agencies in cooperation with the Navy. Attention is needed to protect the health, safety, and welfare of residents and other occupants while maintaining the mission capability of the installation.

Compatible use objectives are derived from the land use suitability matrix for noise zones and range safety zones. Guidelines for the types of land uses that are acceptable within noise-impacted areas and within range safety zones have been developed by the federal government. OPNAV Instruction 11010.36A provides the primary guidance for recommendation of land uses which are considered to be compatible with varying levels of noise exposure. In addition, the interim RAICUZ guidance from the Navy's Range Planning Office provides recommendations for land uses within range safety zones. By comparing the existing land use and zoning as identified in this RAICUZ Update, with the compatibility matrices, land use incompatibilities are identified

1.4 COMPARISON OF 1982 RAICUZ AND 1997 RAICUZ UPDATE

Since the 1982 RAICUZ, the average levels of noise exposure has decreased substantially. In 1997, Noise Zone 2 encompasses just over half of the area that it did in 1982. In 1997, the majority of lands within Noise Zone 2 are immediately to the west of the targets primarily over Range B-16. In addition, the noise exposure levels above 75 L_{dn} have decreased dramatically as well, and instead of being located in a linear pattern from Sheckler Reservoir to the Range B-16 as they were in 1982, the noise contours extend south-southwest from the range to within two miles of the Walker Indian Reservation.

For Range Safety Zones, RSZ A has decreased slightly in size since 1982, while both RSZ B and RSZ C have decreased dramatically in size since the last RAICUZ. RSZ C, in particular, has decreased from over 167,000 acres to less than 30,000 acres, and is limited to the restricted airspace in the immediate vicinity of the range.

1.5 LAND USE ANALYSIS

The majority of lands to the east of the RAICUZ footprint are undeveloped rangeland, devoted to agriculture, or are part of the rapidly growing Fallon area. Found within this large expanse of agriculture are agriculturally oriented residential and industrial uses. Small lot (e.g., one acre) and large lot (10 or more acres) subdivisions permeate the area to the east and northeast of the range. North of the range, lands are primarily undeveloped and are used for undeveloped recreation opportunities. The majority of land south of Range B-16 is public, administered by the Bureau of Land Management (BLM) or Bureau of Reclamation (BUREC), or is part of the Walker River Indian Reservation. In general, the only land use identified in these areas is that associated with livestock grazing, including water tanks and corrals.

According to Churchill County zoning classifications, the majority of the land to the east and northeast of Range B-16 is zoned Rural Resource (RR), which has a residential density of one unit per 20 acres. The other most prevalent land use designations include A-2 and A-3 which are primarily agricultural in nature but allow residential densities of one unit per 5 acres and one unit per 10 acres, respectively. Because most of the lands south and west of the range are under public ownership, land use zoning does not apply to these areas. No commercial or industrial zoned lands were identified within the RAICUZ footprint.

For the most part, planned land use is similar to existing land use patterns. The vast majority of land within the study area developed for this RAICUZ Update is under public ownership and will likely remain undeveloped and utilized for livestock grazing. Land to the east of Range B-16 is planned for agriculture and low density residential uses. Within the RAICUZ boundaries, land subdivision east of the Range is occurring at an increasing rate, with the trend toward one to ten acre parcels.

1.6 FINDINGS

The major findings of the 1997 RAICUZ Update analysis include:

- Average noise levels exceeding 65 L_{dn} (Noise Zones 2 and 3) which are not contained within the range are primarily over undeveloped lands used for grazing, administered by federal agencies.
- RSZ A is entirely within Range B-16, and portions of RSZ B and RSZ C are located outside the range on undeveloped, federal land.
- Land uses within the RAICUZ are primarily undeveloped, agricultural, rural residential in nature; therefore, relatively few incompatibilities can be expected.
- There are no land use incompatibilities identified as a result of noise or from safety concerns related to RSZ A or RSZ B.

- Land use areas of concern based on RSZs include all privately owned lands within RSZ C.
- Residential development pressure is increasing, especially east and northeast of Range B-16 in subdivisions of 5 to 10 acre parcels.
- No residences are now located within Noise Zones 1, 2, or 3 or within RSZ A or B.
- Within RSZ C, 12 residential units were identified during this study resulting in an estimated 31 people residing within this area.
- As a result of shifting the aircraft training operations to the south of the range, the number of noise complaints resulting from training operations at Range B-16 would decrease.

1.7 IMPLEMENTATION STRATEGIES

The purpose of an RAICUZ Implementation Program is to achieve and maintain, to the extent possible, compatible land uses in the vicinity of an air installation. For Range B-16 at NAS Fallon, the primary objective of the RAICUZ is to preserve the existing land uses which are primarily agriculture and open spaces. For those areas identified as potentially incompatible, the objective is to acknowledge this potential and to ensure that the land use does not develop into a more significant problem.

A wide variety of general implementation strategies oriented toward all levels of government and the private sector are available for encouraging compatible land uses within the Range B-16 RAICUZ. A discussion is provided in the report to achieve a comprehensive explanation of the programs and techniques applicable to Range B-16, including:

- operational alternatives
- land exchange, lease, easement, and fee title acquisition
- maintenance of the noise level response program
- monitoring of land uses and close cooperation with local agencies to prevent incompatible developments
- providing accurate measurements of noise and aircraft potential
- providing informational programs for the public and local authorities

Strategies for the local government jurisdictions are also examined and recommended, including the development of:

- planning and zoning ordinances
- building codes
- truth-in-sales and rental ordinances

- transfer of development rights
- public relations and education programs

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WYLE RESEARCH REPORT
WR 96-18

AIRCRAFT NOISE STUDY FOR THE PROPOSED B-16 RANGE COMPLEX, NAVAL AIR STATION FALLON, NEVADA

Prepared For:

Commander
NAVAL FACILITIES ENGINEERING COMMAND
200 Stovall Street
Alexandria, Virginia 22332

Contract No. N68925-93-D-A082

Prepared By:

Joseph J. Czech
WYLE RESEARCH
Wyle Laboratories
2001 Jefferson Davis Highway
Arlington, Virginia 22202

(J/N 59974-01)

August 1996

REPORT

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1.0 INTRODUCTION

The Naval Facilities Engineering Command conducts aircraft noise surveys at various Naval and Marine Corps Ranges throughout the United States. The noise exposure contours developed during these studies are incorporated into Range Air Installations Compatible Use Zones (RAICUZ) or other environmental studies for each station. These environmental documents are in turn used to promote the compatibility of Navy and Marine Corps activities with neighboring land uses. This report presents the results of the noise survey for the proposed realignment of the B-16 Range Complex near Naval Air Station (NAS) Fallon, Nevada.

This report serves as a follow-on document to Reference 1 (Wyle Research Report WR 95-32) which presented the noise survey results for the existing configuration of the B-16 Range Complex (Restricted Area R-4803). As the Navy proposes to realign R-4803 from a north-to-south orientation to a south-to-north orientation, it is the purpose of this report is to estimate the aircraft noise exposure, in terms of Day-Night Average Sound Level (DNL), for existing bombing training operations utilizing the proposed B-16 Range Complex. The primary aircraft type using B-16 is the F/A-18 Hornet.

Section 1.1 summarizes the noise metrics used throughout this report, and Section 1.2 briefly describes the computerized noise exposure model used to compute the impacts due to aircraft noise. Section 2.0 provides a brief description of the existing and proposed R-4803 and its relationship to NAS Fallon, and Section 3.0 addresses proposed aircraft operations and noise exposure.

1.1 Noise Metrics

Noise represents one of the most prominent environmental issues associated with aircraft operations. Although many other sources of noise are present in today's communities, aircraft noise is readily identifiable. An assessment of aircraft noise requires a general understanding of how sound is measured and how it affects people and the natural environment. Appendix A provides a detailed discussion of noise and its effects on people and the environment. For convenience, this section provides a brief overview of noise metrics and their use.

The noise environment around an airfield or in special use airspace can be described in terms of the time-average sound level generated by the aircraft operating at that facility or location. These operations consist of the flight activities conducted during an average day at airfields where operations generally adhere to a fixed schedule (most commercial airports), or during a typical "busy day" at airfields or ranges where operations vary from day to day or between weekdays and weekends (most military airfields and airspaces).

The State of Nevada's noise measure used for assessing aircraft noise exposure is the Day-Night Average Sound Level (abbreviated DNL), in units of the decibel (dB). DNL is an average sound level generated by all aviation-related operations during an average 24-hour period, with the sound levels of nighttime noise events emphasized by adding a 10 dB weighting. Nighttime is defined as the period from 2200 to 0700 hours the following morning. The weighting accounts for the generally lower background sound levels and greater community sensitivity to noises during these hours.

Individual, single noise events are described in terms of the Sound Exposure Level (abbreviated SEL or L_{AE}), in units of decibels. SEL takes into account the amplitude of a sound and the length of time during which each noise event occurs. It thus provides a direct comparison of the relative intrusiveness among single noise events of different intensities and durations. Appendix A provides a more complete discussion of SEL.

Both SEL and DNL employ A-weighted sound levels. "A-weighted" denotes the adjustment of the frequency content of a noise event to represent the way in which the average human ear responds to that sound energy.

1.2 Computerized Noise Exposure Models

Analyses of aircraft noise exposures and compatible land uses around Department of the Navy facilities are normally accomplished using a group of computer-based programs for airfield analyses called NOISEMAP.[2,3] The NOISEMAP suite of computer programs was developed by the U.S. Air Force which serves as the lead Department of Defense (DoD) agency for aircraft noise modeling.

The NOISEMAP suite of computer programs consists of BASEOPS, Master Control Module (MCM) Version 6.4, OMEGA10, OMEGA11, NOISEMAP itself, NMPLOT, and NOISEFILE. NOISEFILE 6.4 is a noise database for many models of aircraft. The BASEOPS program, Version 5.0, allows for entry of runway coordinates, airfield information, flight tracks, flight profiles (powers, altitudes relative to the airfield elevation, and speeds) along each track by each aircraft, numbers of flight operations, run-up coordinates, run-up profiles, and run-up operations. The OMEGA10 program extrapolates/interpolates the SELs for each model of aircraft from the NOISEFILE database, taking into consideration the specified speeds, engine thrust settings, and environmental conditions appropriate to each type of flight operation. The OMEGA11 program calculates maximum A-weighted sound levels for each model of aircraft taking into consideration the engine thrust settings and environmental conditions appropriate to run-up operations. The MCM program provides a user interface for running the OMEGA programs, creating a NOISEMAP input (NMI) file and executing the core NOISEMAP program. The core NOISEMAP program, Version 6.4, incorporates the number of daytime and nighttime operations, flight paths, and profiles of the aircraft to calculate DNL at many points on the ground around the facility. The NMPLOT program, Version 3.01, draws contours of equal DNL for overlay onto land-use maps. For AICUZ studies, as a minimum, DNL contours of 60, 65, 70, 75, and 80 dB are developed. Results of these computer programs and noise impact guidelines provide a relative measure of noise effects around air facilities.

NOISEMAP is most accurate for comparing "before-and-after" noise effects which would result from proposed airfield changes or alternative noise control actions, when the calculations are made in a consistent manner. It allows noise predictions for such proposed actions without the actual implementation and noise monitoring of those actions. Of course, DNL may be measured directly around an airfield rather than calculated. Calculated sound levels are often supplemented by on-site measurements, where useful. NOISEMAP also has the flexibility of calculating sound levels at any specified point so that noise impacts at representative locations around an airfield can be obtained.

Although NOISEMAP is best suited for modeling airfield operations, it can also be used to model range operations since the ground tracks for practice bombing runs are somewhat similar to Touch-and-Go or Field Carrier Landing Practice patterns experienced at airfields.

2.0 DESCRIPTION OF THE EXISTING AND PROPOSED B-16 RANGE COMPLEX

Section 2.1 describes the existing range complex, and Section 2.2 describes the proposed complex.

2.1 Existing B-16 Range Complex

The B-16 Range Complex, denoted as Restricted Area R-4803, is part of the much larger NAS Fallon Range Training Complex (FRTC). The FRTC primarily serves as a bombing and air warfare training center for all Navy and Marine Corps air bases in the United States and consists of several Military Operating Areas (MOAs) and an Air Traffic Control Assigned Airspace (ATCAA).[4] The existing MOAs contain Tactical Aircrew Combat Training System (TACTS) areas, an Electronic Warfare (EW) area, and three other training ranges besides B-16. As depicted in the regional map of Figure 2-1, NAS Fallon and the FRTC is located about 60 miles east of the City of Reno, Nevada. The existing Restricted Area R-4803 is approximately 6 miles west of NAS Fallon and about 8 miles southwest of the City of Fallon. Fallon is the principal city and county seat of Churchill County which contains the existing R-4803. U.S. Highways 50 and 95 are located to the north and east of the range, respectively, intersecting in the City of Fallon.

The B-16 range consists of Weapons Impact Scoring Set (WISS) scored nuclear and conventional bull's-eye targets (bulls). The government controls about 17,640 acres (28 square miles) in the southern end of the R-4803 (R-4803S) near the bulls as shown in Figure 2-2.[5] The elevation of the targets is about 3,900 ft MSL and the magnetic declination (at the Air Station) as of March 1991 is 16.0° East.[6] All maps in this report depict a north arrow pointing to true north. The local terrain is relatively flat, with a slight slope up to the low-lying Dead Camel Mountains, which bound the southwestern edge of the range.[4]

The B-16 Range Complex is open daily from 0715 to 2330 hours (local). Only inert ordnance can be used on B-16. The NAS Fallon Range Users Manual[7] lists five types of inert (dummy) ordnance allowed on the range, of which the low-drag MK76/BDU33 and high-drag MK106/BDU48 are the most prevalent. For conventional

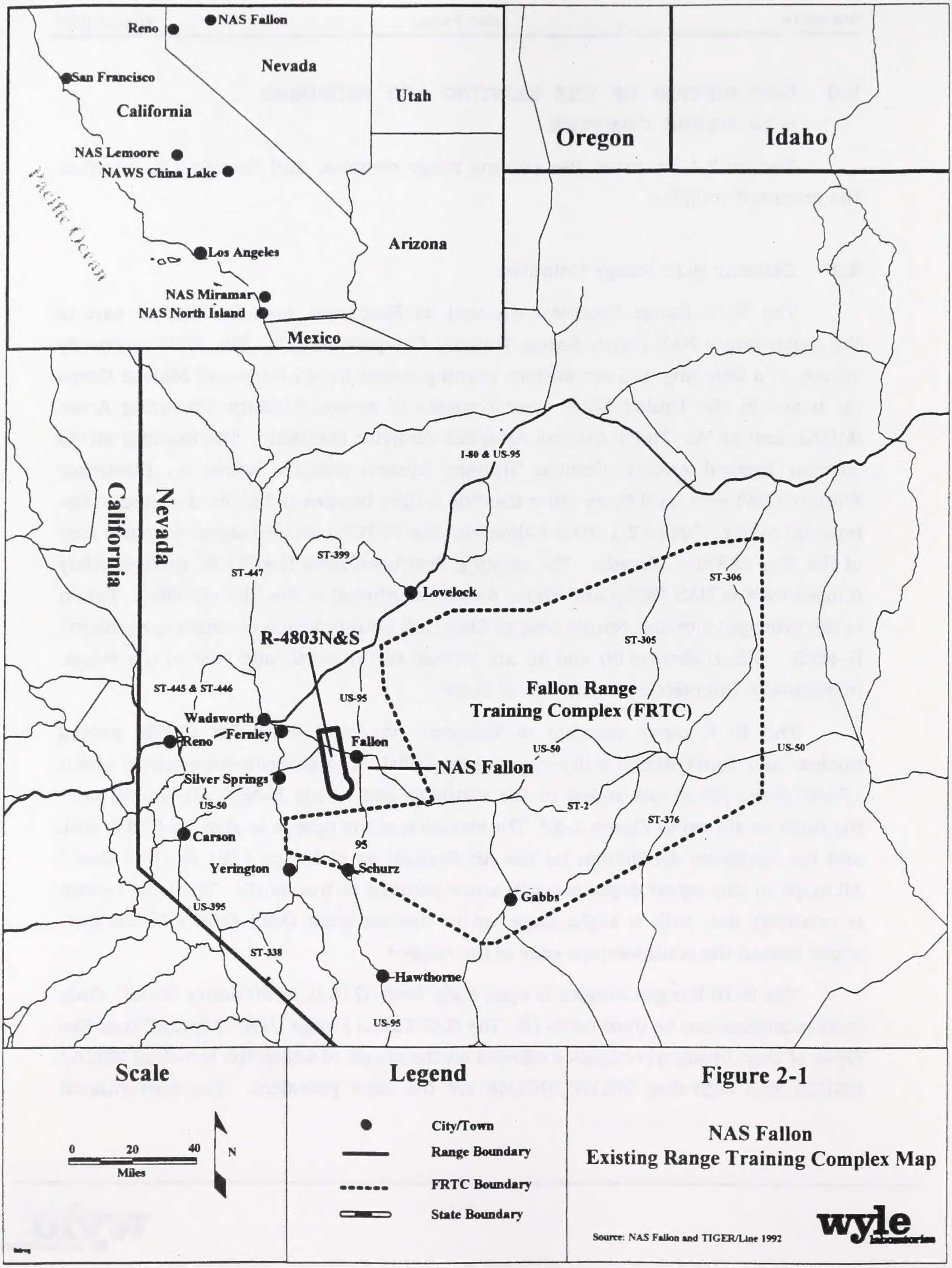

Figure 2-1

NAS Fallon
Existing Range Training Complex Map

Source: NAS Fallon and TIGER/Line 1992

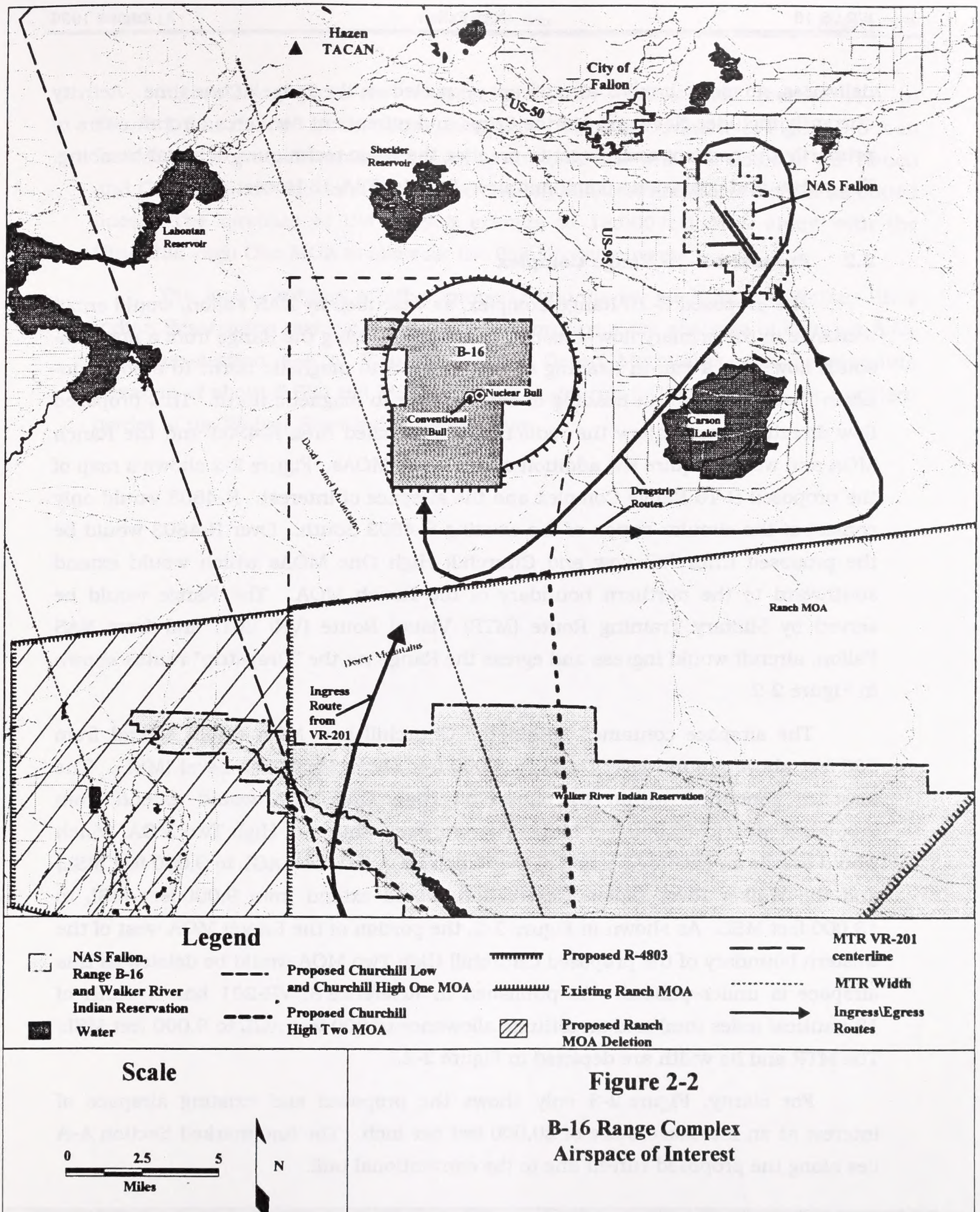

Figure 2-2

**B-16 Range Complex
Airspace of Interest**

Source: NAS Fallon, TIGER\Line, Reference 8

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deliveries, no more than six aircraft are permitted on the range at one time. Activity currently includes Navy and Marine Corps and infrequent Air Force aircraft users of primarily the conventional target to practice the basic techniques of aerial bombing. The noise- and operations-dominant aircraft is the F/A-18 Hornet.

2.2 Proposed B-16 Range Complex

The proposed B-16 Range Complex, as described by NAS Fallon, would entail a change in the primary flow direction of aircraft utilizing the Range from a north-to-south flow with a run-in heading of 150° relative to magnetic north to a south-to-north flow with a run-in heading of 360° relative to magnetic north. This proposed flow direction would allow the reduction of Restricted Area R-4803 and the Ranch MOA and would require the addition of three new MOAs. Figure 2-2 shows a map of the proposed B-16 Range Complex and the airspace of interest. R-4803 would only consist of the circular region of the existing R-4803 South. Over R-4803 would be the proposed Churchill Low and Churchill High One MOAs which would extend southward to the northern boundary of the Ranch MOA. The Range would be served by Military Training Route (MTR) Visual Route (VR) 201, and from NAS Fallon, aircraft would ingress and egress the Range via the "Dragstrip" routes shown in Figure 2-2.

The airspace contained within the Churchill Low MOA would extend from 500 feet above ground level (AGL) to 9,000 feet above Mean Sea Level (MSL). The airspace contained within the Churchill High One MOA would extend from 9,000 feet MSL to 18,000 feet MSL. The proposed Churchill High Two MOA, which would overlie an existing portion of the Ranch MOA (500 feet AGL to 9,000 feet MSL) and the Walker River Indian Reservation, would extend from 9,000 feet MSL to 13,000 feet MSL. As shown in Figure 2-2, the portion of the Ranch MOA west of the western boundary of the proposed Churchill High Two MOA would be deleted as this airspace is under-utilized. As published in Reference 8, VR-201 has a width of 12 nautical miles (nm) and an altitude allowance of 200 feet AGL to 9,000 feet MSL. The MTR and its width are depicted in Figure 2-2.

For clarity, Figure 2-3 only shows the proposed and existing airspace of interest at an increased scale of 20,000 feet per inch. The line marked Section A–A lies along the proposed run-in line to the conventional bull.

Figure 2-4 depicts the airspace profile at cross-section marked A–A in Figure 2-3 as defined in the above paragraph. Since the ordinate of Figure 2-3 is in feet MSL, the ground terrain is shown by the bold line with the floors of the Ranch and Churchill Low MOAs shown approximately 500 feet above the terrain as dotted lines. The airspace of the R-4803 extends to 18,000 feet MSL along with the Churchill High One MOA to allow for the Pop-Up maneuvers.

The lateral extents of other property boundaries such as the Walker River Indian Reservation and the B-16 Range is shown near the abscissa of Figure 2-3 for the cross-section A–A of Figure 2-2. The Desert Mountains with a maximum elevation of about 5,600 feet MSL along the target run-in line lie along the northern border of the Walker River Indian Reservation.

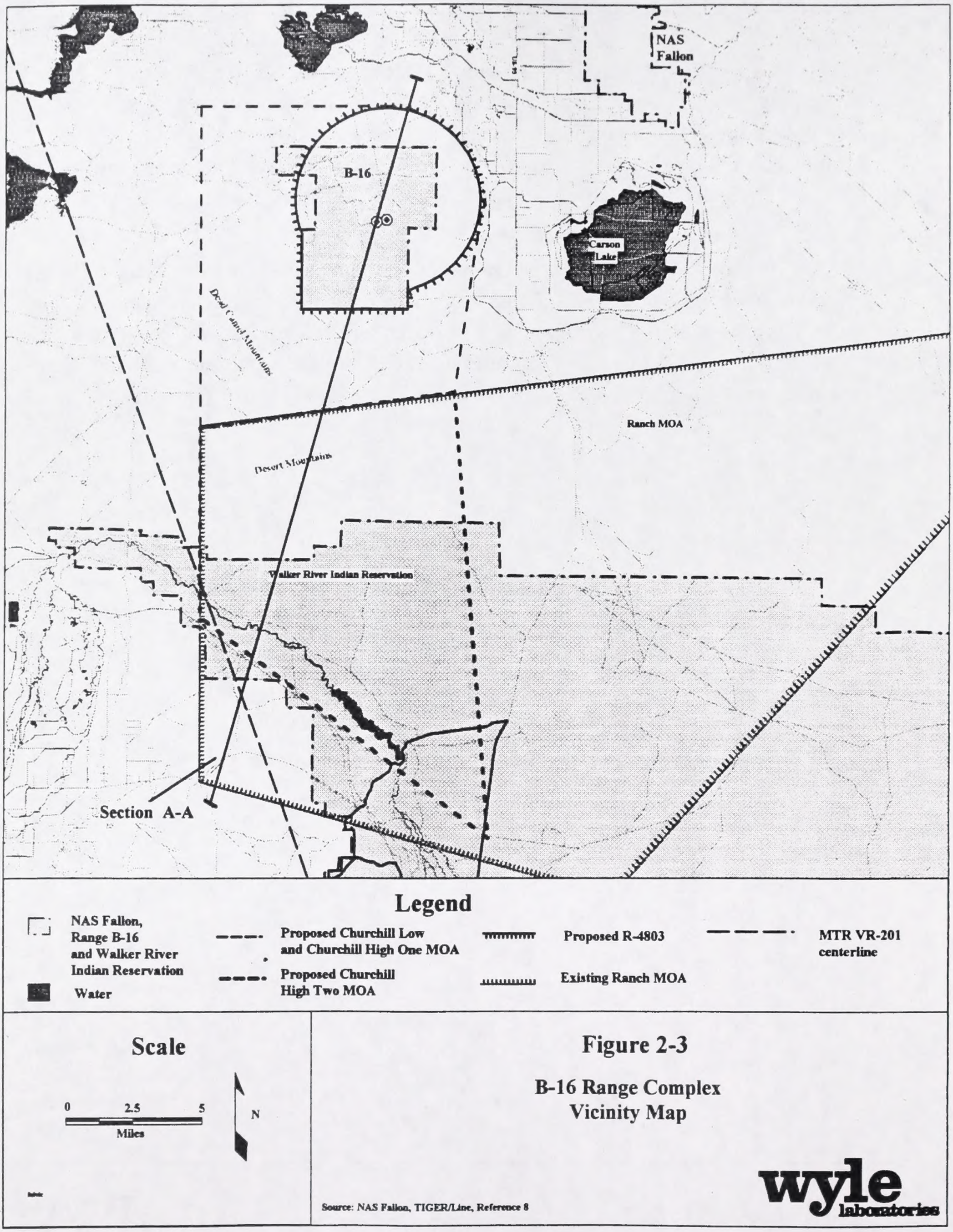
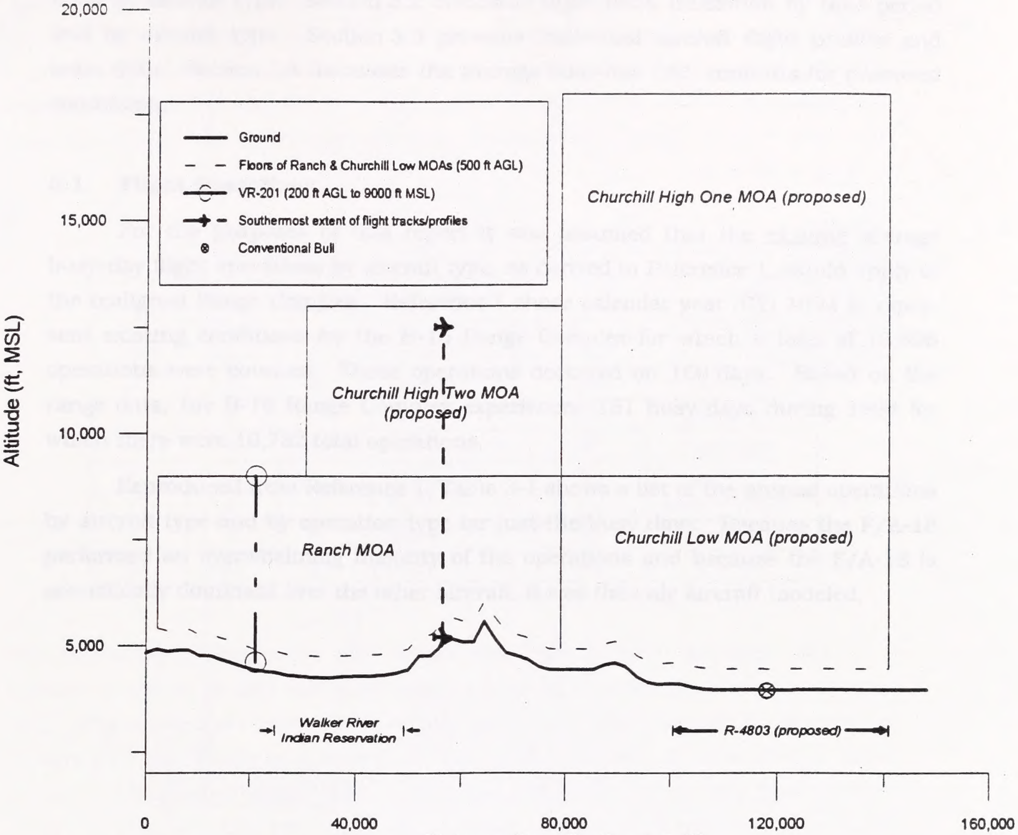

NAS Fallon
B-16
Carson Lake
Dead Camel Mountains
Ranch MOA
Desert Mountains
Walker River Indian Reservation
Section A-A
Legend
NAS Fallon, Range B-16 and Walker River Indian Reservation
Water
Proposed Churchill Low and Churchill High One MOA
Proposed Churchill High Two MOA
Proposed R-4803
Existing Ranch MOA
MTR VR-201 centerline
Scale
0
2.5
5
Miles
N

Figure 2-3

B-16 Range Complex Vicinity Map

Source: NAS Fallon, TIGER/Line, Reference 8

wyle laboratories



Source: NAS Fallon and References 5 and 8

Figure 2-4. Airspace Profile at Section A–A of Figure 2-3 (Airspace of Interest).

3.0 PROPOSED AIRCRAFT OPERATIONS AND NOISE EXPOSURE

Section 3.1 discusses reported and modeled average busy-day flight operations by aircraft type. Section 3.2 discusses flight track utilization by time period and by aircraft type. Section 3.3 presents individual aircraft flight profiles and noise data. Section 3.4 discusses the average busy-day DNL contours for proposed conditions.

3.1 Flight Operations

For the purposes of this report it was assumed that the existing average busy-day flight operations by aircraft type, as derived in Reference 1, would apply to the realigned Range Complex. Reference 1 chose calendar year (CY) 1994 to represent existing conditions for the B-16 Range Complex for which a total of 10,898 operations were counted. These operations occurred on 169 days. Based on the range data, the B-16 Range Complex experienced 151 busy-days during 1994 for which there were 10,732 total operations.

Reproduced from Reference 1, Table 3-1 shows a list of the annual operations by aircraft type and by operation type for just the busy days. Because the F/A-18 performed an overwhelming majority of the operations and because the F/A-18 is acoustically dominant over the other aircraft, it was the only aircraft modeled.

3.2 Flight Track Utilization

Access to the B-16 Range Complex would be from either (a) the MTR VR-201 or (b) the so-called "Dragstrip" routes to/from NAS Fallon, shown in Figure 2-2. It was estimated by the NAS that 95 percent of the B-16 traffic would use the Dragstrip routes and 5 percent would utilize VR-201. Table 3-2 shows the counts of the number of F/A-18 aircraft which would utilize VR-201 and the Dragstrip routes by maneuver type. Table 3-2 was derived from the same range data which was used to compile Table 3-1.

Table 3-2
Ingress/Egress Utilization for B-16 Range for Busy-Days During CY94

Maneuver	**Annual Sorties From:**					
	Dragstrip Route			**VR-201**		
	Day	**Night**	**Total**	**Day**	**Night**	**Total**
High Dive	549	9	558	29	0	29
Low Dive	228	1	229	12	0	12
High Pop	120	0	120	6	0	6
Low Pop	139	0	139	7	0	7
Radar Pattern	111	0	111	6	0	6
Laydown	52	0	52	3	0	3
TOTAL	1,199	10	1,209	63	0	63

Note: 95 percent Dragstrip and 5 percent VR-201.

For bombing training flight operations, the noise model requires those operations to be assigned to flight tracks which typify the various bombing training maneuvers. Reference 1 served as a foundation for the modeled flight tracks. The major modification to the flight tracks in Reference 1 is the change in run-in heading from 150° magnetic to 360° magnetic. NAS Fallon made further adjustments to all modeled flight tracks, except for the High Dive and Low Dive patterns. The modeled flight tracks are shown in Figures 3-1 through 3-5 and the changes are described in the following paragraph.

Relative to Reference 1:

1. The length of the run-in (and downwind leg) for High Pop-Up flight tracks, shown in Figure 3-2, was increased by about 2 nm for a resultant distance of 10 nm. The left/right breaks were maintained at a distance of approximately 5 nm from the target.

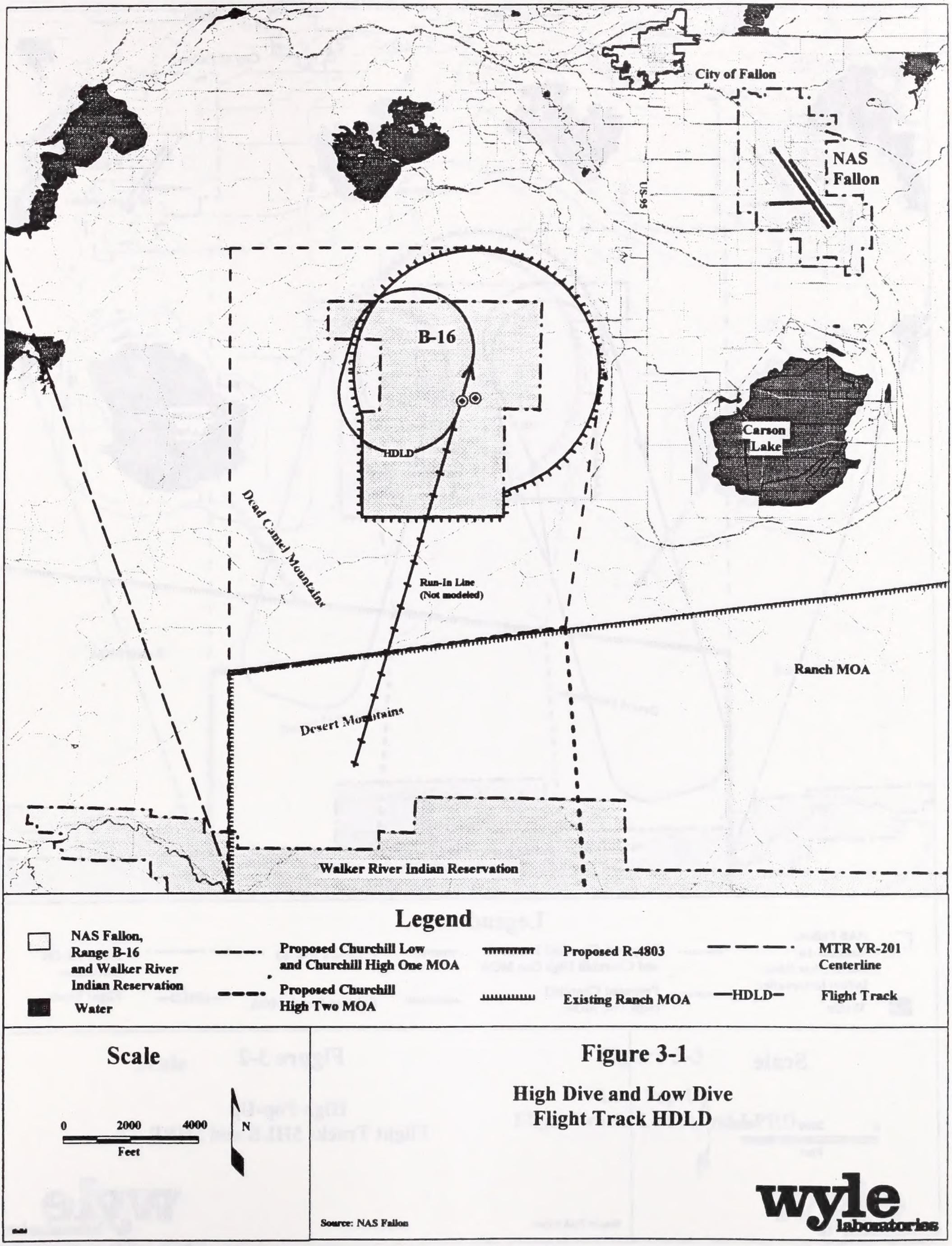


Figure 3-1

High Dive and Low Dive Flight Track HDLD

Source: NAS Fallon

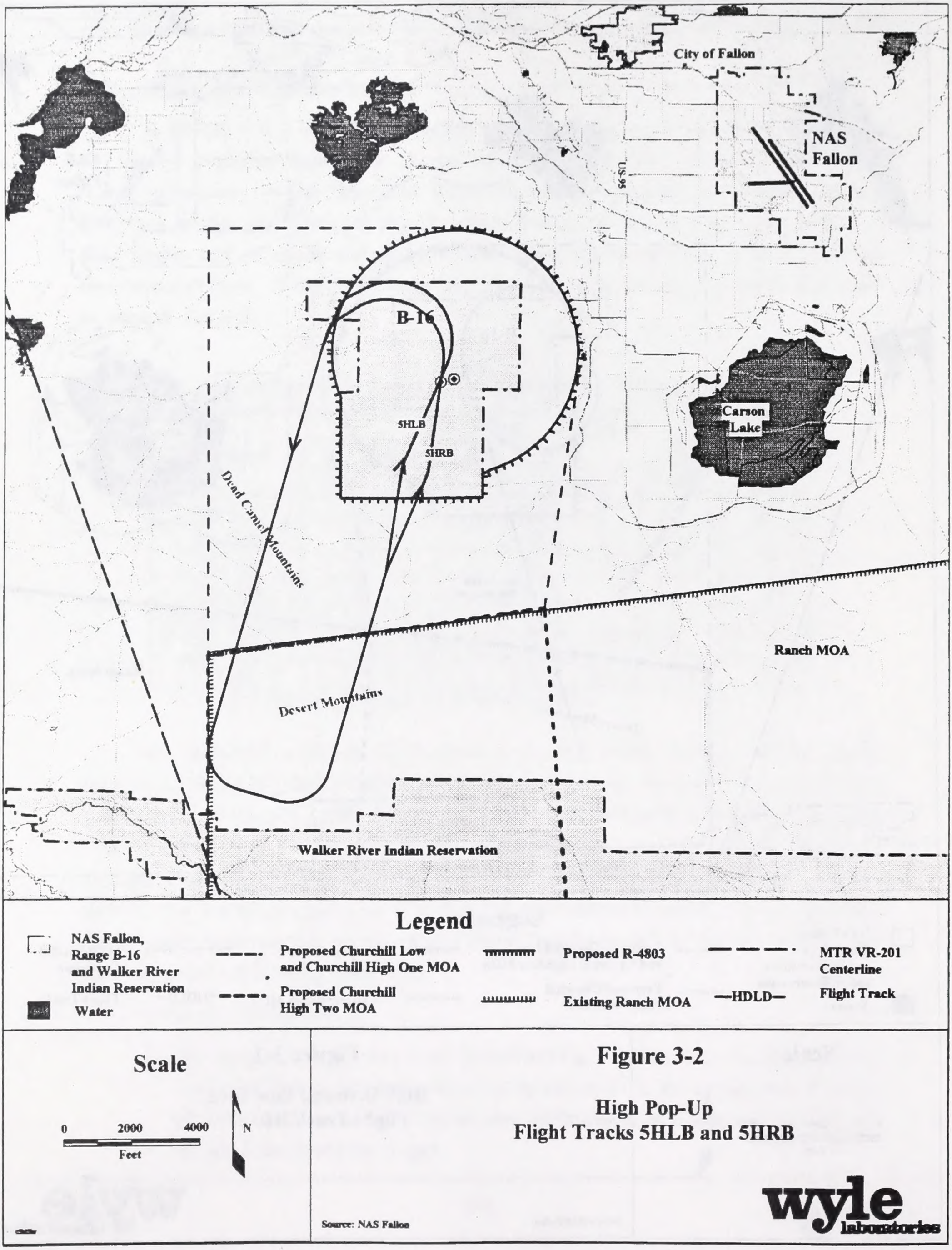


Figure 3-2

High Pop-Up
Flight Tracks 5HLB and 5HRB

Source: NAS Fallon

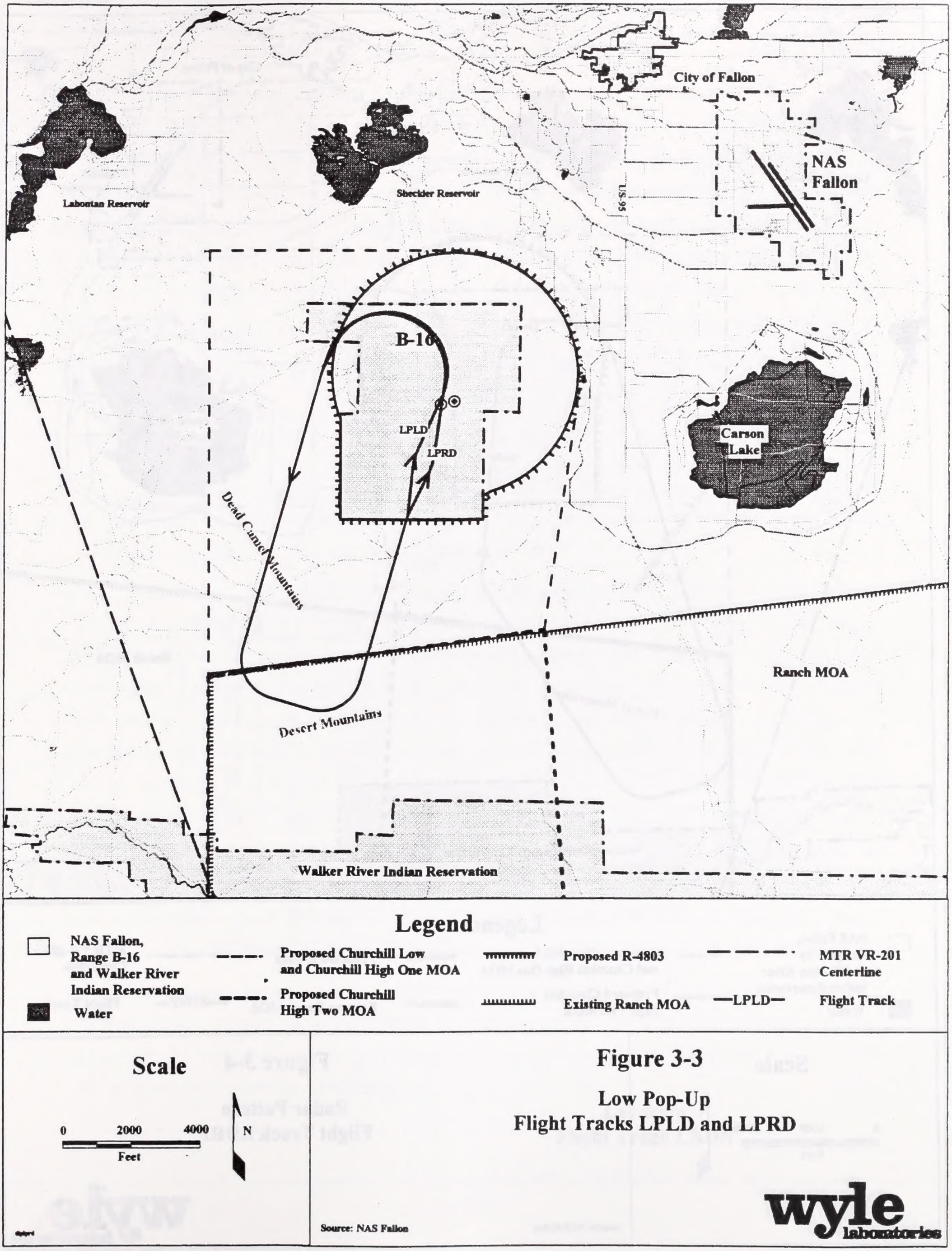


Figure 3-3

Low Pop-Up
Flight Tracks LPLD and LPRD

Source: NAS Fallon

wyle laboratories

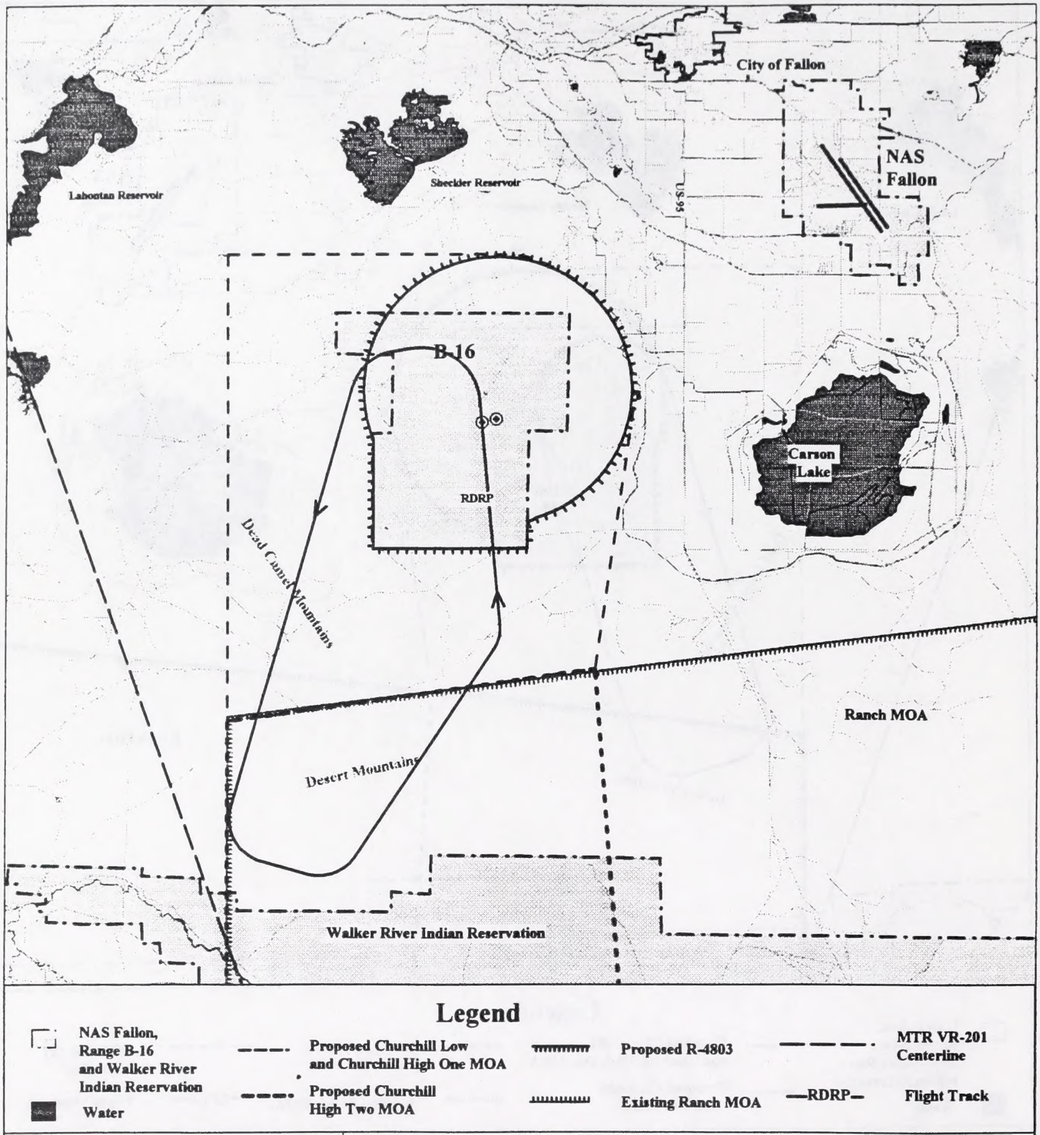


Figure 3-4

Radar Pattern
Flight Track RDRP

Source: NAS Fallon

wyle laboratories

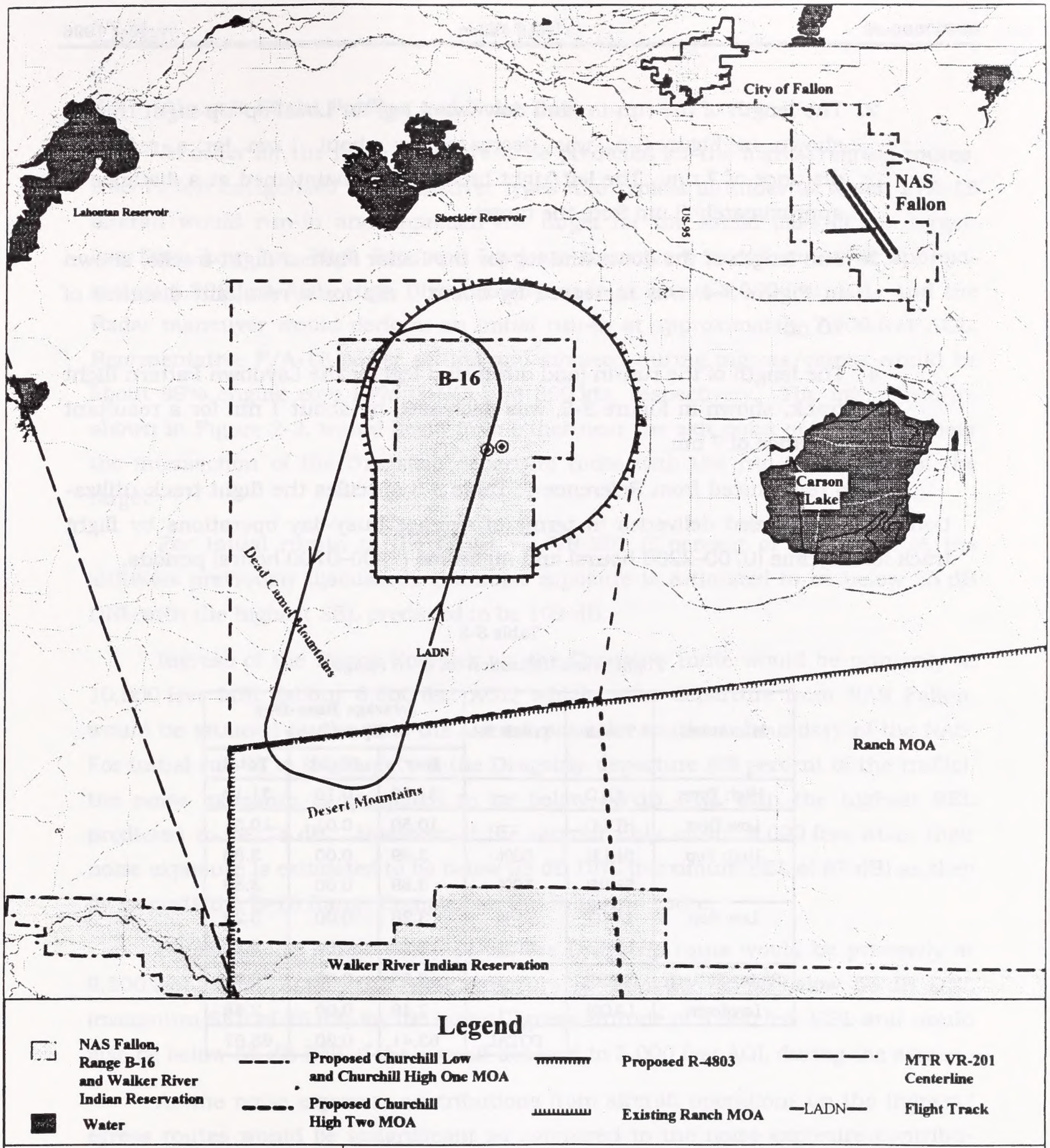


Figure 3-5

Laydown
Flight Track LADN

Source: NAS Fallon

2. The length of the run-in (and downwind leg) for Low Pop-Up flight tracks, shown in Figure 3-3, was decreased by about 1 nm for a resultant distance of 7 nm. The left/right breaks were maintained at a distance of approximately 3 nm from the target.
3. The length of the downwind leg for the Radar Pattern flight tracks, shown in Figure 3-4, was increased by about 1 nm for a resultant distance of 10 nm.
4. The length of the run-in (and downwind leg) for the Laydown Pattern flight track, shown in Figure 3-5, was decreased by about 1 nm for a resultant distance of 7 nm.

Also reproduced from Reference 1, Table 3-3 specifies the flight track utilization for the modeled deliveries in terms of average busy-day operations by flight track for daytime (0700–2200 hours) and nighttime (2200–0700 hours) periods.

Table 3-3

Flight Track Utilization for B-16 Range

Maneuver	**Track**	**Track %**	**Average Busy-Day Operations**		
			Day	**Night**	**Total**
High Dive	HDLD	---	31.00	0.19	31.19
Low Dive	HDLD	---	10.50	0.01	10.51
High Pop	5HLB	50%	3.89	0.00	3.89
	5HRB	50%	3.89	0.00	3.89
Low Pop	LPLD	50%	3.28	0.00	3.28
	LPRD	50%	3.28	0.00	3.28
Radar Pattern	RDRP	---	5.09	0.00	5.09
Laydown	LADN	---	2.48	0.00	2.48
		TOTAL	63.41	0.20	63.61

3.3 Aircraft Flight Profiles and Noise Data

In order for the noise exposure to be predicted for the ingress/egress routes, NAS Fallon categorized the maneuver types into typical altitudes at which F/A-18 aircraft would run-in and approach the target for the initial pass of the target. Low Dive, Low Pop, High Pop, and Laydown maneuvers would run-in at approximately 1,200 feet AGL, High Dives would run-in at about 3,500 feet AGL, and the Radar maneuver would perform an initial run-in at approximately 7,500 feet AGL. Representative F/A-18 power setting and airspeed during ingress/egress would be about 89% engine core RPM (%NC) and 300 kts, respectively. The initial run-in, shown in Figure 2-2, would begin from either near the exit point of VR-201 or near the intersection of the Dragstrip departure route with the run-in heading of the target.

For initial run-in to the target via VR-201 (5 percent of the traffic at the altitudes previously discussed), the noise exposure is estimated to be below 55 dB DNL with the highest SEL predicted to be 102 dB.

Ingress of the Range Complex via the Dragstrip route would be primarily at 10,500 feet MSL (about 6,600 feet AGL) which, after departure from NAS Fallon, would be attained by the time the aircraft pass the southern boundary of the NAS. For initial run-in to the target via the Dragstrip departure (95 percent of the traffic), the noise exposure is estimated to be below 55 dB DNL with the highest SEL predicted to be 74 dB. However, if the aircraft only attain 5,000 feet AGL, their noise exposure is estimated to be below 55 dB DNL (maximum SEL of 87 dB) as they fly towards the B-16 Range Complex on the Dragstrip route.

Egress of the Range Complex via the Dragstrip route would be primarily at 9,500 feet MSL. Again, the noise exposure is estimated to be below 55 dB DNL (maximum SEL of 76 dB) for the typical egress altitude of 9,500 feet MSL and would also be below 55 dB DNL if the aircraft descend to 5,000 feet AGL during the egress.

As the noise exposure contributions from aircraft operations on the ingress/egress routes would be insignificant as compared to the noise exposure contributions of the modeled bombing practice operations, the ingress/egress routes were eliminated from further modeling.

Proposed flight profiles (aircraft power settings, altitudes above the elevation of the target, and airspeeds on each modeled flight track) for the F/A-18 are shown in Appendix B. The profiles are similar to the existing conditions[1] but have been reviewed and adjusted by NAS Fallon. The primary changes are described in the following paragraph.

Relative to Reference 1:

1. The altitudes on the base leg and run-in before the left/right breaks on the High Pop-Up were decreased by 300–500 feet. Figures B-3 and B-4 show the modeled flight profiles.
2. The altitudes on the run-in, both before and during the left/right breaks, on the Low Pop-Up were decreased by 300–10,000 feet. Figures B-5 and B-6 show the modeled flight profiles.
3. The altitude of the Radar Pattern was decreased by 500 feet. Figure B-7 shows the modeled profile.
4. The altitudes on the base leg of the Laydown Pattern were decreased by 500 feet. Figure B-8 shows the modeled flight profile.

Reference noise data for the F/A-18 was measured in October 1995 after the publication of Reference 1. The newly measured data was used to update the NOISEFILE database and was used to model operations at the B-16 Range Complex. The reference noise data used in Reference 1 was up to about 5 dB higher than the newly measured data.

Since weather is an important factor in the propagation of noise, NOISEMAP requires the daily average temperatures and relative humidities for each month to determine the appropriate values to acoustically represent the given year. The values for entry into NOISEMAP of 69°F and 34%RH from Reference 1 were used for this report.

3.4 Noise Exposure for Proposed Conditions

Using the data described in Sections 3.1 through 3.3, NOISEMAP Version 6.4 was employed to calculate and plot the 60 dB through 80 dB DNL contours for the average busy-day. These contours are shown in Figure 3-6. Note that the computations resulted in no DNLs above 85 dB.

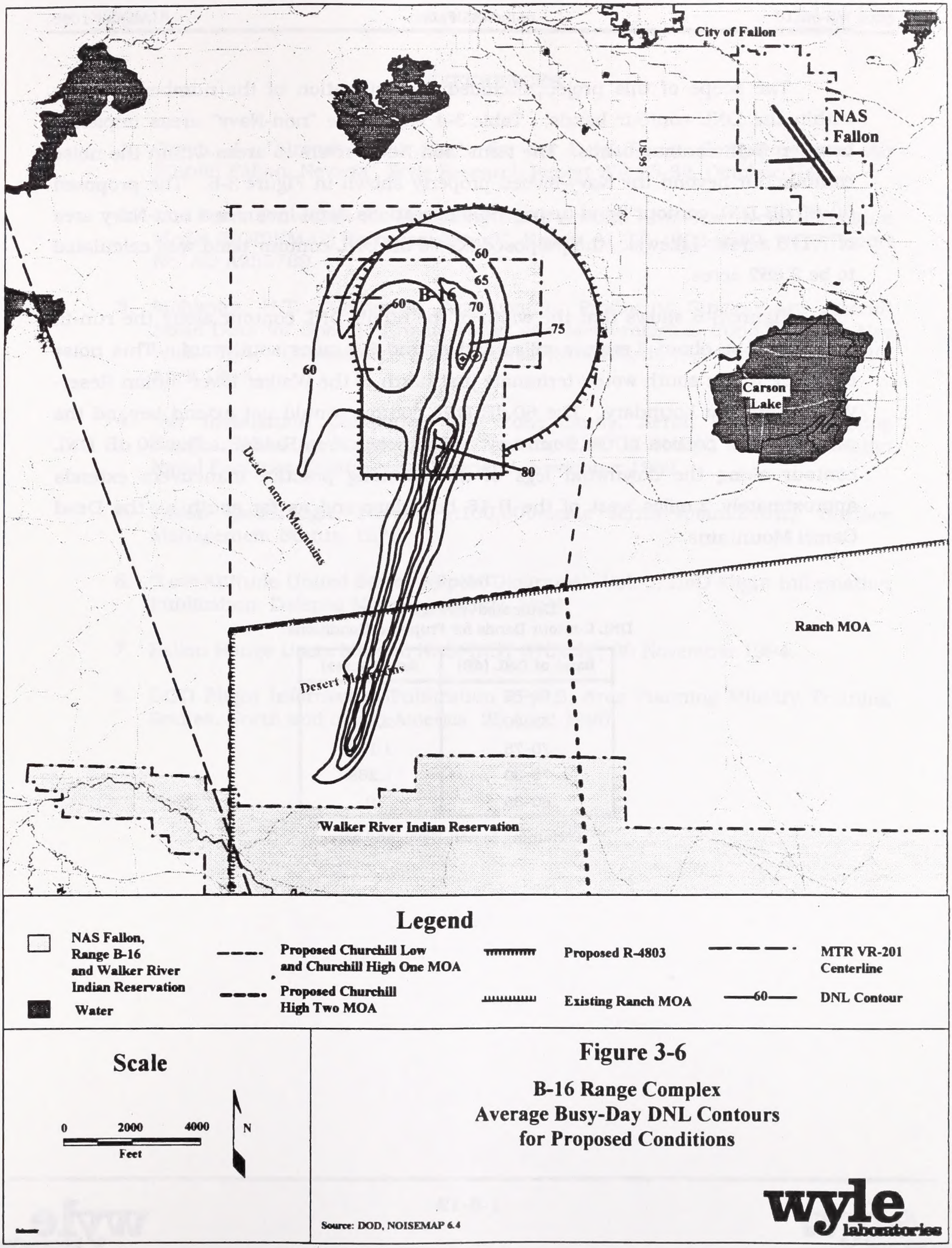


Figure 3-6

B-16 Range Complex
Average Busy-Day DNL Contours
for Proposed Conditions

Source: DOD, NOISEMAP 6.4

The scope of this project included the estimation of the number of acres within the DNL contour bands. Table 3-4 shows the "non-Navy" areas impacted between 5 dB contour bands. The term "non-Navy" refers to areas within the noise contour but beyond the Navy-owned property shown in Figure 3-6. The proposed 60–65 dB DNL contour band (using 1994 operations data) includes a non-Navy area of 7,175 acres. Likewise, the proposed 65–70 dB DNL contour band was calculated to be 2,652 acres.

Figure 3-6 shows that the width of the 60 dB DNL contour along the run-in line would be about 2 statute miles and extend 9.5 miles southward. This noise exposure to the south would terminate just north of the Walker River Indian Reservation northern boundary. The 60 dB DNL contour would not extend beyond the northernmost portion of the boundary of Restricted Area R-4803. The 60 dB DNL contour along the downwind legs of the bombing practice maneuvers extends approximately 2 miles west of the B-16 boundary and as far south as the Dead Camel Mountains.

Table 3-4

Estimated Acreage Within
DNL Contour Bands for Proposed Conditions*

Band of DNL (dB)	Area (Acres)
60–65	7,175
65–70	2,652
70–75	1,115
75–80	1,268
80–85	0

* Pertaining to non-Navy land area

REFERENCES

1. Czech, J., "Aircraft Noise Study for the B-16 Range Complex, Naval Air Station Fallon, Nevada", Wyle Research Report WR 95-32, October 1995.

2. "Air Force Procedure for Predicting Noise Around Airbases: Noise Exposure Model (NOISEMAP) Technical Report", Report AL-TR-1992-0059, NTIS Report No. AD A255769.

3. Mohlman, H.T., "Computer Programs for Producing Single-Event Aircraft Noise Data for Specific Engine Power and Meteorological Conditions for Use With USAF Community Noise Model (NOISEMAP)", AFAMRL-TR-83-020, April 1983.

4. "Air Installation Compatible Use Zone Study, Aerial Weapons Training Ranges, Naval Air Station Fallon, Nevada, RAICUZ Study", Western Division Naval Facilities Engineering Command, November 1982.

5. Fallon Quadrangle, Nevada 1:100,000-scale series (planimetric), Surface Management Status, 1978.

6. "Low-Altitude United States Airport Diagrams", Vol. 3, DoD Flight Information Publication, Defense Mapping Agency, 1994.

7. Fallon Range Users Manual NASFINST 3752.1F, 30 November 1994.

8. DOD Flight Information Publication AP/1B, Area Planning Military Training Routes, North and South America, 25 April 1996.

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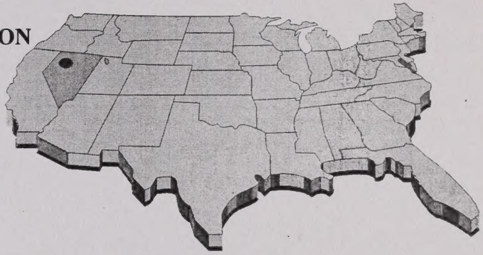


APPENDIX F

BIOLOGICAL RESOURCES

APPENDIX F BIOLOGICAL RESOURCES

TABLE F-1
PLANT SPECIES IN THE REGION OF THE PROPOSED LAND WITHDRAWAL

Common Name	Scientific Name
sand verbena	*Abronia turbinata*
desert needlegrass	*Achnatherum speciosa*
Thurber's needlegrass	*Achnatherum thurberianum*
wheatgrass	*Agropyron* spp.
Iodinebush, picklebush	*Allenrolfea occidentalis*
fiddleneck	*Amsinckia tesselata*
Indian hemp, dogbane	*Apocynum cannabinum*
low sagebrush	*Artemesia arbuscula*
bud sagebrush	*Artemesia spinescens*
basin big sagebrush	*Artemesia tridentata* var. *tridentata*
Wyoming big sagebrush	*Artemesia tridentata* var. *wyomingensis*
mountain big sagebrush	*Artemesia vaseyana*
narrowleaf milkweed	*Asclepias fascicularis*
showy milkweed	*Asclepias speciosa*
asparagus	*Asparagus officinalis* ssp. *officinalis*
aster	*Aster lanceolatus* ssp. *hesperius*
milkvetch	*Astragalus diphysus*
violet milkvetch	*Astragalus iodanthus* var. *iodanthus*
four winged saltbush	*Atriplex canescens*
shadscale	*Atriplex confertifolia*
quail bush/big-salt bush	*Atriplex lentiformis*
Nuttall saltbush	*Atriplex nuttalli*
arrowscale	*Atriplex phyllostegia*
torrey saltbush	*Atriplex torreyi*
wedgescale saltbush	*Atriplex truncata*
water-hyssop	*Bacopa eisenii*
fivehook bassia	*Bassia hyssopifolia*
King's eyelash grass	*Blepharidachne kingii*
field mustard	*Brassica campestris*
foxtail chess	*Bromus rubens*
cheatgrass	*Bromus tectorum*
suncups	*Camissonia claviformis* ssp. *integrior*
evening primrose	*Camissonia parvula*
white-top	*Cardaria draba*
sedge	*Carex* spp.
hairy wild cabbage	*Caulanthanus pilosus*
Russian knapweed	*Centaurea repens*
winterfat	*Ceratoides lanata* var. *lanata*
Steve's duskymaiden	*Chaenactis stevioides* var. *stevioides*
morning brides	*Chaenactis xantiana*
lambsquarters	*Chenopodium album*
strawberry blite	*Chenopodium foliosum*
goosefoot	*Chenopodium glaucum* ssp. *salinum*
rubber rabbitbrush	*Chrysothamnus nauseosus*
rabbitbrush	*Chrysothamnus* sp.
green rabbitbrush	*Chrysothamnus viscidiflorus* ssp. *puberulus*

Common Name	**Scientific Name**
bull thistle	*Circium vulgare*
yellow beeplant	*Cleome lutea*
Canada horseweed	*Conyza canadensis*
matted cryptantha	*Cryptantha circumscissa*
cryptantha	*Cryptantha micrantha*
winged cryptantha	*Cryptantha pterocarya*
spring parsley	*Cymopterus corrugatus*
chufa fatsedge	*Cyperus esculentus*
Sierra tansy mustard	*Descurainia californica*
tansy mustard	*Descurainia paradisa*
pinnate tansy mustard	*Descurainia pinnata* ssp. *paradisa*
flixweed	*Descurainia sophia*
desert saltgrass/inland saltgrass	*Distichilis spicata* var. *stricta*
millet	*Echinochloa crusgalli*
Russian olive	*Elaeagnus angustifolius*
common spike rush	*Eleocharis palustris*
dwarf spike rush	*Eleocharis parishii*
Great Basin wild rye	*Elymus cinereus*
beardless wild rye	*Elymus triticoides*
green ephedra	*Ephedra nevadensis*
hairy willow weed	*Epilobium ciliatum*
common horsetail	*Equisetum arvense*
smooth horsetail	*Equisetum laevigatum*
phlox	*Eriastrum wilcoxii*
buckwheat	*Eriogonum angulosum*
cushion eriogonum	*Eriogonum ovalifolium*
buckwheat	*Eriogonum pusillum*
wicker buckwheat	*Eriogonum vimeneum*
red-stemmed filartee	*Erodium cicutarium*
spurge	*Euphorbia ocellata* var. *arenicola*
goldenrod	*Euthania occidentalis*
Great Basin gilia	*Gilia leptomeria*
carved seed	*Glyptopleura marginata*
spiny hop-sage	*Grayia spinosa*
halogeton	*Halogeton glomeratus*
common sunflower	*Helianthus annuus*
desert sunflower	*Helianthus deserticola*
salt heliotrope	*Heliotropum currassivicum*
Galleta grass	*Hilaria jamesii*
cheesebush	*Hymenoclea fasciculata*
many branched gilia	*Ipomopsis polycladon*
poverty weed	*Iva axillaris*
wire rush	*Juncus balticus*
common kochia	*Kochia scoparia*
prickly lettuce	*Lactuca serriola*
tall whitetop	*Lepidium latifolium*
pepperweed	*Lepidium nitidum*
bird's-foot trefoil	*Lotus tenuis*
lupine	*Lupinus pusillus* var. *intermontanus*
boxthorn	*Lycium shockleyi*
bugleweed	*Lycopus asper*

Common Name	Scientific Name
prairie pink	*Lygodesmia grandiflora*
smooth desert dandelion	*Malacothrix glabrata*
sow thistle	*Malacothrix sonchoides*
wild mint	*Mentha arvensis*
white-stemmed stick-leaf	*Mentzelia albicaulis*
common monkey flower	*Mimulus guttatus*
four-o'clock	*Mirabilis alipes*
scratch grass	*Muhlenbergia*
ground nama	*Nama aretioides*
narrow-leafed nama	*Nama depressum*
alkali weed	*Nitrophila occidentalis*
birdcage evening primrose	*Oenothera deltoides* var. *piperi*
mohave prickly pear	*Opuntia erinacea*
prickly pear	*Opuntia pulchella*
Nevada oryctes	*Oryctes nevadensis*
Indian ricegrass	*Oryzopsis hymenoides*
sand penstemon	*Penstemon acuminatus* var. *latebracteatus*
common phacelia	*Phacelia bicolor* var. *bicolor*
popcorn flower	*Plagiobothrys kingii* var. *harknessii*
buckhorn plantain	*Plantago lanceolata*
Nevada bluegrass	*Poa nevadensis*
Sandberg bluegrass	*Poa sandbergii*
common knotweed	*Polygonum arenastrum*
knotweed	*Polygonum argyrocoleon*
willow weed	*Polygonum lapathifolium*
spotted knotweed/lady's thumb	*Polygonum persicaria*
kochia, gray molly	*Polygonum* sp.
rabbit's foot grass	*Polypogon monspeliensis*
freemont cottonwood	*Populus fremontii* ssp. *fremontii*
common purslane	*Portulaca oleracea*
Indigo bush, false dahlea	*Psorothamnus polydenius*
seaside buttercup	*Ranunculus cymbylaria* ssp. *saximontanus*
gooseberry	*Ribes* sp.
wild rose	*Rosa woodsii*
curly dock	*Rumex crispus*
sand dock	*Rumex venosus*
samphire, pickleweed	*Salicornia europaea*
narrow-leaved willow	*Salix exigua*
sandbar willow	*Salix hindsianda*
red willow	*Salix laevigata*
salsola	*Salsola tragus*
Russian thistle	*Salsola kali tenuifolia*
Bailey greasewood	*Sarcobatus vermiculatus* var. *baileyi*
black greasewood	*Sarcobatus vermiculatus*
silver buffaloberry	*Shepherdia argentea*
squirrel tail	*Elymus elymoides*
nightshade	*Solanum dulcamara*
salt marsh sand spurrey	*Spergularia marina*
desert globemallow/apricot mellow	*Sphaeralcea ambigua ssp. monticola*
alkali sacaton	*Sporobolus airoides*
longbeak streptanthella	*Streptanthella longirostris*

Common Name	Scientific Name
horned sea-bite	*Suaeda calceoliformis*
bush seepweed	*Suaeda moquinii*
seepweed, desert blite	*Suaeda torreyana*
snowberry	*Symphoricarpos* sp.
tamarisk	*Tamarix pentranda*
tamarisk	*Tamarix ramossisima*
common dandelion	*Taraxacum officinale*
littleleaf horsebrush	*Tetradymia glabrata*
spiny horsebrush	*Tetradymia spinosa*
hairy horsebrush	*Tetradymia tetrameras*
borage	*Tiquilia nuttallii*
goat's beard	*Tragopogon dubius*
strawberry clover	*Trifolium fragiferum*
variegated clover	*Trifolium variegatum*
smallflower sand verbena	*Tripterocalyx crux-maltae*
siberian elm	*Ulmus pumilla*
stinging nettle	*Urtica dioica*
speedwell	*Veronica peregrina*
Idaho fescue	*Vulpia idahoensis*
six-weeks fescue	*Vulpia octoflora*
cocklebur	*Xanthium strumarium*

Source: USFWS 1995

TABLE F-2
ANIMAL SPECIES IN THE REGION OF THE PROPOSED LAND WITHDRAWAL

Common Name	**Scientific Name**
Fish	
Sacramento perch	*Archoplites interruptus*
goldfish	*Carassius auratus*
Asiatic (or common) carp	*Cyprinus carpio*
mosquitofish	*Gambusia affinis*
white catfish	*Ictalurus catus*
black bullhead	*Ictalurus melas*
brown bullhead	*Ictalurus nebulosus*
channel catfish	*Ictalurus punctatus*
green sunfish	*Lepomis cyanellus*
bluegill	*Lepomis macrochirus*
smallmouth blackbass	*Micropterus dolomieui*
largemouth black bass	*Micropterus salmoides*
white bass	*Morone chrysops*
striped bass	*Morone saxatilis*
rainbow trout	*Oncorhynchus mykiss*
Sacramento blackfish	*Orthodon microlepidotus*
yellow perch	*Percan flavescens*
fathead minnow	*Pimephales promelas*
white crappie	*Pomoxis annularis*
black crappie	*Pomoxis nigromaculatus*
Lahontan speckled dace	*Rhinichthys osculus robustus*
Lahontan red shiner	*Richardsonius egregius*
brown trout	*Salmo trutta*
brook trout	*Salvelinus fontinalus*
walleye	*Stizostedion vitreum*
Amphibians and Reptiles	
western toad	*Bufo boreas*
zebra-tailed lizard	*Callisuarus draconoides*
rubber boa	*Charina bottae*
western whiptail	*Cnemidophorus tigris*
Great Basin rattlesnake	*Crotalus viridis lutosus*
common collared lizard	*Crotaphytus collaris*
long-nosed leopard lizard	*Gambelia wislizenii*
Pacific treefrog	*Hyla regilla*
night snake	*Hypsiglena torquata*
striped whipsnake	*Masticophis taeniatus*
desert horned lizard	*Phrynosoma platyrhinos*
gopher snake	*Pituophis melanoleucus*
northern leopard frog	*Rana pipens*
long-nosed snake	*Rhinocheilus lecontei*
western patch-nosed snake	*Salvadora hexalepis*
Great Basin spadefoot	*Scaphiopus intermontanus*
sagebrush lizard	*Sceloperus graciosus*
desert spiny lizard	*Sceloperus magister*
western fence lizard	*Sceloperus occidentalis*
western terrestrial garter snake	*Thamnophis elegans*

Common Name	Scientific Name
side-blotched lizard	*Uta stansburiana*
Birds	
Cooper's hawk	*Accipiter cooperii*
northern goshawk	*Accipiter gentilis*
sharp-shinned hawk	*Accipiter striatus*
spotted sandpiper	*Actitis macularia*
Clarks' grebe	*Aechmophorus clarkii*
western grebe	*Aechmophorus occidentalis*
northern saw-whet owl	*Aegolius acadicus*
red-winged blackbird	*Agelaius phoeniceus*
tricolored blackbird	*Agelaius tricolor*
chukar	*Alectoris chukar*
sage sparrow	*Amphispiza belli*
black-throated sparrow	*Amphispiza bilineata*
northern pintail	*Anas acuta*
American widgeon	*Anas americana*
northern shoveler	*Anas clypeata*
green-winged teal	*Anas crecca*
cinnamon teal	*Anas cyanoptera*
blue-winged teal	*Anas discors*
mallard	*Anas platyrhynchos*
gadwall	*Anas strepera*
American pipit	*Anthus rubescens*
scrub jay	*Aphelocoma coerulescens*
golden eagle	*Aquila chrysaetos*
black-chinned hummingbird	*Archilochus alexandri*
great blue heron	*Ardea herodias*
great blue heron	*Ardea herodias*
short-eared owl	*Asio flammeus*
long-eared owl	*Asio otus*
western burrowing owl	*Athene cunicularia*
lesser scaup	*Aythya affinis*
redhead	*Aythya americana*
canvasback	*Aythya valisineria*
cedar waxwing	*Bombycilla cedrorum*
Bohemian waxwing	*Bombycilla garrulus*
American bittern	*Botaurus lentiginosus*
Canada goose	*Branta canadensis*
great horned owl	*Bubo virginianus*
cattle egret	*Bubuleus ibis*
bufflehead	*Bucephala albeola*
common goldeneye	*Bucephala clangula*
red-tailed hawk	*Buteo jamaicensis*
rough-legged hawk	*Buteo lagopus*
ferruginous hawk	*Buteo regalis*
Swainson's hawk	*Buteo swainsoni*
California quail	*Callipepla californica*
pine siskin	*Carduelis pinus*
American goldfinch	*Carduelis tristis*
Cassin's finch	*Carpodacus cassinii*

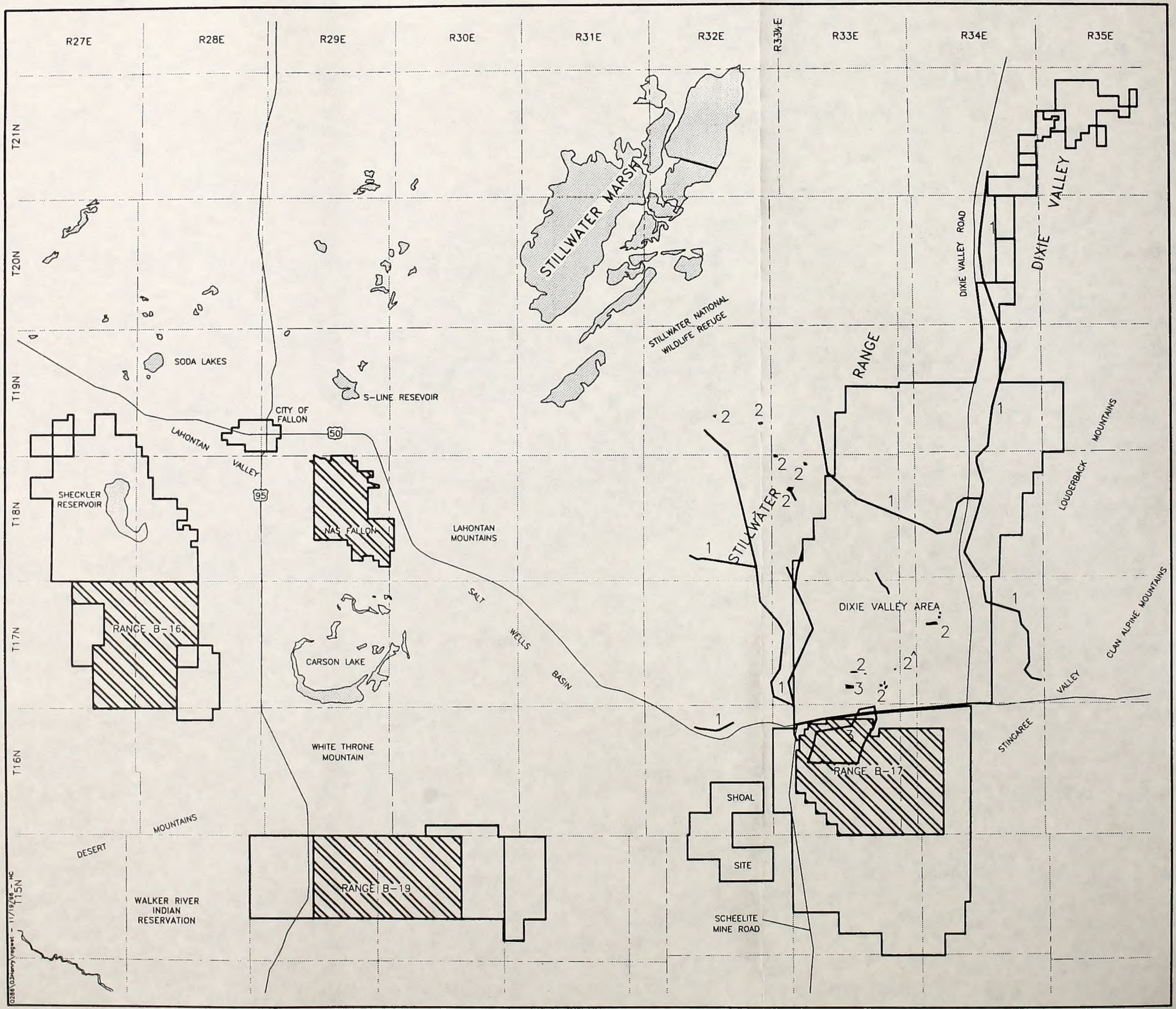
Common Name	**Scientific Name**
house finch	*Carpodacus mexicanus*
great egret	*Casmerodius albus*
turkey vulture	*Cathartes aura*
hermit thrush	*Catharus guttatus*
canyon wren	*Catherpes mexicanus*
sage grouse	*Centrocercus urophasianus*
brown creeper	*Certhia americana*
belted kingfisher	*Ceryle alcyon*
Western snowy plover	*Charadrius alexandrius*
killdeer	*Charadrius vociferus*
snow goose	*Chen caerulescens*
black tern	*Chlidonias niger*
lark sparrow	*Chondestes grammacus*
common nighthawk	*Chordeiles minor*
American dipper	*Cinclus mexicanus*
northern harrier	*Circus cyaneus*
evening grosbeak	*Coccothraustes vespertinus*
northern flicker	*Colaptes auratus*
rock dove	*Columba livia*
western wood-pewee	*Contopus sordidulus*
American crow	*Corvus brachyrhynchos*
common raven	*Corvus corax*
tundra swan	*Cygnus columbianus*
blue grouse	*Dendragapus obscurus*
yellow-rumped warbler	*Dendroica coronata*
black-throated gray warbler	*Dendroica nigrescens*
yellow warbler	*Dendroica petechia*
snowy egret	*Egretta thula*
willow flycatcher	*Empidonax traillii*
horned lark	*Eremophila alpestris*
Brewer's blackbird	*Euphagus cyanocephalus*
merlin	*Falco columbarius*
prairie falcon	*Falco mexicanus*
peregrine falcon	*Falco peregrinus*
American kestrel	*Falco sparverius*
American coot	*Fulica americana*
common snipe	*Gallinago gallinago*
common moor hens	*Gallinula chloropus*
common yellowthroat	*Geothlypis trichas*
northern pygmy owl	*Glaucidium gnoma*
blue grosbeak	*Guiraca caerulea*
pinyon jay	*Gymnorhinus cyanocephalus*
bald eagle	*Haliaeetus leucocephalus*
black-necked stilt	*Himantopus mexicanus*
cliff swallow	*Hirundo pyrrhonota*
barn swallow	*Hirundo rustica*
yellow-breasted chat	*Icteria virens*
northern oriole	*Icterus galbula*
least bittern	*Ixobrychus exilis hesperis*
dark-eyed junco	*Junco hyemalis*
northern shrike	*Lanius excubitor*

Common Name	**Scientific Name**
loggerhead shrike	*Lanius ludovicianus*
herring gull	*Larus argentatus*
California gull	*Larus californicus*
ring-billed gull	*Larus delawarensis*
rosy finch	*Laucosticte arctoa*
long-billed dowitcher	*Limnodromus scolopaceus*
red crossbill	*Loxia curvirostra*
Lewis' woodpecker	*Melanerpes lewis*
song sparrow	*Melospiza melodia*
common merganser	*Mergus merganser*
northern mockingbird	*Mimus polyglottos*
brown-headed cowbird	*Molothrus ater*
Townsend's solitaire	*Myadestes townsendi*
ash-throated flycatcher	*Myiarchus cinerascens*
Clark's nutcracker	*Nucifraga columbiana*
long-billed curlew	*Numenius americanus*
black-crowned night heron	*Nycticorax nycticorax*
MacGillivray's warbler	*Oporornis tolmiei*
mountain quail	*Oreortyx pictus*
sage thrasher	*Oreoscoptes montanus*
flammulated owl	*Otus flammeolus*
western screech owl	*Otus kennicottii*
ruddy duck	*Oxyura jamaicensis*
osprey	*Pandion haliaetus*
mountain chickadee	*Parus gambeli*
plain titmouse	*Parus inornatus*
house sparrow	*Passer domesticus*
savannah sparrow	*Passerculus sandwichensis*
Lazuli bunting	*Passerina ameona*
American white pelican	*Pelecanus erythrorhynchos*
double-crested cormorant	*Phalacrocorax auritus*
common poorwill	*Phalaenoptilus nuttallii*
Wilson's phalarope	*Phalaropus tricolor*
black-headed grosbeak	*Pheucticus melanocephalus*
black-billed magpie	*Pica pica*
hairy woodpecker	*Picoides villosus*
rufous-sided towhee	*Pipilo erythrophthalmus*
western tanager	*Piranga ludoviciana*
white-faced ibis	*Plegadis chihi*
eared grebe	*Podiceps nigricollis*
vesper sparrow	*Pooecetes gramineus*
sora	*Porzana carolina*
bushtit	*Psaltriparus minimus*
great-tailed grackle	*Quiscalus mexicanus*
common grackle	*Quiscalus quiscula*
Virginia rail	*Rallus limicola*
American avocet	*Recurvirostra americana*
ruby-crowned kinglet	*Regulus calendula*
golden-crowned kinglet	*Regulus satrapa*
bank swallow	*Riparia riparia*
rock wren	*Salpinctes obsoletus*

Common Name	Scientific Name
Say's phoebe	*Sayornis saya*
mountain bluebird	*Sialia currucoides*
western bluebird	*Sialia mexicana*
red-breasted nuthatch	*Sitta canadensis*
white-breasted nuthatch	*Sitta carolinensis*
red-naped sapsucker	*Sphyrapicus nuchalis*
Williamson's sapsucker	*Sphyrapicus thyroideus*
Brewer's sparrow	*Spizella breweri*
chipping sparrow	*Spizella passerina*
northern rough-winged swallow	*Stelgidopteryx serripennis*
Forster's tern	*Sterna forsteri*
western meadowlark	*Sturnella neglecta*
European starling	*Sturnus vulgaris*
tree swallow	*Tachycineta bicolor*
violet-green swallow	*Tachycineta thalassina*
Bewick's wren	*Thryomanes bewickii*
house wren	*Troglodytes aedon*
American robin	*Turdus migratorius*
western kingbird	*Tyrannus verticalis*
barn owl	*Tyto alba*
warbling vireo	*Vireo gilvus*
solitary vireo	*Vireo solitarius*
yellow-headed blackbird	*Xanthocephalus xanthocephalus*
mourning dove	*Zenaida macroura*
white-crowned sparrow	*Zonotrichia leucophrys*
Mammals	
whitetail antelope squirrel	*Ammospermophilus leucurus*
pronghorn	*Antilocapra americana*
pallid bat	*Antrozous pallidus*
pygmy rabbit	*Brachylagus idahoensis*
coyote	*Canis latrans*
beaver	*Castor canadensis*
golden-mantled squirrel	*Citellus lateralis*
Townsend's ground squirrel	*Citellus townsendi*
Merriam kangaroo rat	*Dipodomys merriami*
Great Basin kangaroo rat	*Dipodomys microps*
Ord kangaroo rat	*Dipodomys ordi*
panamint kangaroo rat	*Dipodomys panamintinus*
porcupine	*Erethizon dorsatum*
least chipmunk	*Eutamia minimus*
mountain lion	*Felis concolor*
sagebrush vole	*Lagurus curtatus*
silver-haired bat	*Lasionycteris noctivagans*
bobcat	*Lynx rufus*
yellowbelly marmot	*Marmota flaviventris*
striped skunk	*Mephitis mephitis*
dark kangaroo mouse	*Microdipodops megacephalus*
longtail vole	*Microtus longicaudus*
shorttail weasel	*Mustela erminea*
longtail weasel	*Mustela frenata*

Common Name	Scientific Name
California myotis	*Myotis californicus*
long-eared myotis	*Myotis evotis*
little brown myotis	*Myotis lucifugus*
small-footed myotis	*Myotis subulatus*
fringed myotis	*Myotis thysanodes*
cave myotis	*Myotis velifer*
long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
bushytail woodrat	*Neotoma cinerea*
desert woodrat	*Neotoma lepida*
mule deer	*Odocoileus hemionus*
muskrat	*Ondatra zibethica*
northern grasshopper mouse	*Onychomys leucogaster*
southern grasshopper mouse	*Onychomys torridus*
bighorn sheep	*Ovis canadensis*
longtail pocket mouse	*Perognathus formosus*
little pocket mouse	*Perognathus longimembris*
Great Basin pocket mouse	*Perognathus parvus*
canyon mouse	*Peromyscus crinitus*
deer mouse	*Peromyscus maniculatus*
pinyon mouse	*Peromyscus truei*
western pipistrel	*Pipistrellus hesperus*
Townsend's big-eared bat	*Plecotus townsendi*
raccoon	*Procyon lotor*
western harvest mouse	*Reithrodontomys megalotis*
Merriam shrew	*Sorex merriami*
vagrant shrew	*Sorex vagrans*
spotted skunk	*Spilogale putorius*
desert cottontail	*Sylvilagus auduboni*
blacktail jackrabbit	*Sylvilagus californicus*
mountain cottontail	*Sylvilagus nuttalli*
badger	*Taxidea taxus*
valley pocket gopher	*Thomomys bottae*
northern pocket gopher	*Thomomys talpoides*
red fox	*Vulpes fulva*
desert kit fox	*Vulpes macrotis*

Source: Erikson undated; U.S. Navy 1982a; BLM undated b; Bardwell 1987; Burt 1964; Stebbins 1985; National Geographic Society 1992; USFWS 1995



LEGEND:

▨ NAS Fallon and Ranges

Wetlands

1 = Riverine

2 = Palustrine

3 = Lacustrine

N

0 2.5 5

1"=5MI.
(APPROXIMATE)

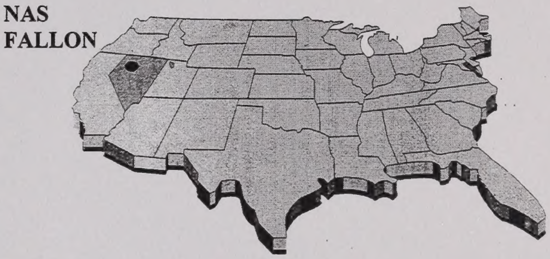
Wetlands in the vicinity of NAS Fallon include several lakes, ponds, and streams.

Regional Wetlands

NAS Fallon, Nevada

Figure F-1

Source: USFWS 1995



APPENDIX G

ARCHEOLOGICAL SITES AND SURVEYS

APPENDIX G ARCHEOLOGICAL SITES AND SURVEYS

TABLE G-1
ARCHEOLOGICAL SITES LOCATED WITHIN NAS FALLON AND THE FRTC

Area	Site Number[a]	Investigation[b]	NRHP Status/ CRES Rating[c]	Bibliographic Reference
NAS	Ch-109/UC Ch-82/03-586	SC?	S0	UNK
NAS	Ch-911	UNK	S4?	Letter from Brooks
NAS	03-1829	OV	UNK	Townley 1977; Pendleton *et al.* 1982
NAS	03-1870	OV	UNK	Paher 1970; Harris 1973; Pendleton *et al.* 1982
NAS	Ch-1403 through -1411	SC	S2?	Busby *et al.* 1989
NAS	Ch-1412	SC	S3?	Busby *et al.* 1989
NAS	Ch-1413 through -1432	SC	S4	Busby *et al.* 1989
NAS	Ch-1433 through -1445	SC	Not rated	Busby *et al.* 1989
NAS	Ch-1775	T	–	Busby *et al.* 1992
NAS	Ch-1778 through -1781	S	–	Busby *et al.* 1992
NAS	Ch-1751, -1752	S	–	Stornetta 1991
NAS	I91-1	S	–	Busby *et al.* 1991
NAS	I91-2	S	–	Busby *et al.* 1991
B-16	Ch-84	AR	S0	Heizer & Baumhoff 1962; Napton 1971
B-16	Ch-101/UC Ch-72/03-578	AR	S4	Destroyed
B-16	Ch-964/03-3279	S	UNK	Pope 1983
B-16	I-1 through I-8	S	–	Stornetta 1992
B-16	Ch-1786, -1787	S	–	Stornetta 1992
B-19	Ch-110/UC Ch-83/03-587	SC	S0	Bennyhoff & Heizer 1958
B-19	Ch-112/UC Ch-83?/UC Ch-85/ 03-2197	AR	UNK	
B-19	Ch-943	S	UNK	May contain Ch-110 & -112
B-19	Ch-1015	S,IC	UNK	
B-19	03-1814	OV	UNK	Bailey & Phoenix 1944; Pendleton *et al.* 1982
B-19	03-3581	S,IC	UNK	

TABLE G-1
ARCHEOLOGICAL SITES LOCATED WITHIN NAS FALLON AND THE FRTC

Area	Site Number[a]	Investigation[b]	NRHP Status/ CRES Rating[c]	Bibliographic Reference
B-19	712-11,13,20,23,25 through 29, 30 through 33,35,37	3	–	TetraTech/ARS 1992b
B-19	712-6 through 10,12,14 through 19,21,22,24,36, 38-40	3	–	TetraTech/ARS 1992b
B-19	I-9, I-10	S	–	Stornetta 1992
B-17	CrNV-31-4454 through -4456	S	S3	Self 1993
B-17	Ch-197/03-1099	S	UNK	Rusco 1975
B-17	Ch-199/03-1283	S	UNK	Rusco 1975
B-17	Ch-606/03-1212	S,IC	S4	
B-17	Ch-1004/03-1166	S	UNK	Hatoff 1978
B-17	Ch-1005/03-1213	S	UNK	Hatoff 1979
B-17	03-1825	OV	UNK	Mordy & McCaughey 1968; Paher 1970; Shamberger 1974; Pendleton *et al.* 1982
B-17	03-1826	OV	UNK	Shamberger 1974; Pendleton *et al.* 1982
B-17	03-1827	OV	UNK	Pendleton *et al.* 1982
B-17	03-1844	OV	UNK	Shamberger 1974; Pendleton *et al.* 1982
B-17	03-1850	OV	UNK	Shamberger 1974; Willden & Speed 1974; Pendleton *et al.* 1982
B-17	03-1871	OV	UNK	Shamberger 1974; Pendleton *et al.* 1982
B-17	03-1889	OV	UNK	Shamberger 1974; Pendleton *et al.* 1982
B-17	03-3207	S	UNK	Hatoff 1982
B-17	03-3516	S	UNK	Botti 1985
B-17	03-3530	S	UNK	Hatoff 1985
B-17	03-3565	S,IC	UNK	Sutton 1985
B-17	03-3742/IMR 608-1	S	UNK	Juell 1987
B-17	03-3744 through -3747/ IMR 608-3 through -6	S	UNK	Juell 1987
B-17	None (Nevada Fairview Mine)	M	UNK	Hardesty, NSM, BLM maps

TABLE G-1
ARCHEOLOGICAL SITES LOCATED WITHIN NAS FALLON AND THE FRTC

Area	Site Number[a]	Investigation[b]	NRHP Status/ CRES Rating[c]	Bibliographic Reference
B-17	None (Donneyville Road)	M	UNK	Hardesty, NSM, BLM maps
B-17	None (Nevada Crown Mine)	M	UNK	Hardesty, NSM, BLM maps
B-17	None (3 rock shelters)	M	UNK	Hardesty, NSM, BLM maps
B-17	CRNV-3993	S	S4?	IMR 1988
B-17	Ch-1402	S	S4?	Reno 1989
B-17	712-1 through -3	S	–	TetraTech/ARS 1992a
B-17	712-4	S	–	TetraTech/ARS 1992b
B-17	712-5	3	–	TetraTech/ARS 1992b

(a) Site Number: Nevada State Museum (NSM) project numbers are written: 1-# or 18-#, where a "1" refers to Churchill County, and an 18 to Lyon County. Bureau of Land Management (BLM) project numbers are prefixed with a Cr3-. The "P" enclosed within parentheses at the end of the number refers to a positive result, i.e., one or more sites were located. UNK = Unknown.

(b) Investigation: AR = amateur report only, no know professional visitation or collections. DC = diagnostic collected. E = excavation. IC = isolate, collected. M = map location only. OV = overview only. RR = rock art record. SC = survey with collection. S = survey without collection. T = testing.

(c) NRHP Status/CRES Rating: S0 = insufficient data for evaluation. S1 = site has a clear potential for public instruction or for yielding scientific information of importance on the national, state or local level; has important connections with major historical events or personages; and/or possesses cultural value for segments of the modern population. Most aboriginal sites in this category are in relatively good condition and are either rare or unique (e.g. Early Man) or are large and particularly well-representative of their types (BLM 1985:14-15). S2 = criteria for S1 rating are only minimally met. Site is generally in good condition and additional work could lead to a reassessment. S2 sites are usually not unique or very rare, lack important historical association and are not particularly well-representative of their types. Aboriginal camps or villages which are large but do not have great antiquity and have only limited depth potential are suitable for this rating. Typical S2 historic sites include recently abandoned ranches, small mining camps, cemeteries, railbeds, roads and trails (BLM 1985:15). S3 = Sites with little depth, few or lacking features, and if old, are small, or if large, are comparatively recent and diffuse (BLM 1985:15). Site may have been damaged but some research potential remains. Sites not rated as S1 or S2 but which are wholly or partially intact will be given an S3 rating. Common S3 sites include: seasonal camps, hunting and gathering activity areas, isolated lithic or ceramic artifacts, chipping areas, lithic workshops and quarries, historic dumps, isolated historic buildings and other structures, and small mining operations. S4 = site has been destroyed as a result of vandalism, illicit collection, commercial development, or archeological collection or excavation. CRES ratings were derived from Pendleton *et al.* (1982).

TABLE G-2
CULTURAL RESOURCES SURVEYS CONDUCTED AT NAS FALLON

Area	NSM Number/Project Name	Sites/ Isolates	Reference
NAS	1-226	0/0	Crew 1984
NAS	1-89	2/0	Johnson 1982
NAS	Overview and Class III "Mainside"	0/0	Busby *et al.* 1989
NAS	Navy Family Housing Project	0/0	Busby *et al.* 1991
NAS	NV-030-91-08	1/1	Stornetta 1991
NAS	Test Drive Area: Tracked Vehicles	5/2	Busby & Harmon 1991
NAS	Stillwater Technical Report No. 1	0/0	Creger 1991
NAS	Optic Cable NAS Fallon Boundary	0/0	Intermountain Rsch 1987
16/20	1-32/Red Mountain Common Use Area	0/0	Buder & Bennett 1976
16/20	Range Debris Holding Areas	0/0	Hause 1990
B-16	1-105/Churchill County Sanitary Landfill	1/0	Pope 1983
16/19	Fencelines at Bravo 16 and 19	3/10	Stornetta 1992
B-16	Geothermal Test Holes	0/0	Hatoff & Ruhstaller 1977
19/20	1-49/Powerline ROW, N-16376	3/0	Hatoff & Ruhstaller 1977
B-19	1-133/Rolling A Well (JDR 6181)	0/0	Mabe 1981a
B-19	1-136/South Bass Flat Stock Water Store	0/0	Mabe 1981b
B-16	UNK	0/0	Hause 1990
B-16 B-17	Training Ranges B-17 & B-19 Ground Training Areas	712-4 to 714-40	TetraTech 1992b (Marken *et al.*)
B-17	Fenceline at B-17 Training Range	3/0	Self 1993
B-17	1-62/11-Mile-La Plata Fence (JDR 5124)	0/0	Abbett 1977
B-17	Laser Designator	0/0	Creger 1991
B-17	4 Proposed Electrical Warfare Range Installation	0/1	Stornetta 1988
B-17	Electrical Warfare Site #70 Instrument Route	1/0	Self 1991
B-17	206 Missile Landing Area	0/1	Self 1989
B-17	Targets on Range Bravo-17	1/0	Reno 1989
B-17	1-207/Bell Canyon Guzzler No. 3	0/0	Bardwell 1980a
B-17	1-210/GZ Canyon Guzzler No. 1	0/0	Bardwell 1980b

TABLE G-2
CULTURAL RESOURCES SURVEYS CONDUCTED AT NAS FALLON

Area	NSM Number/Project Name	Sites/ Isolates	Reference
B-17	1-119/Fairview Guzzler	0/0	Bardwell 1981a
B-17	1-121 Slate Mine Guzzler	0/0	Bardwell 1981b
B-17	1-55/Geothermal Resource Exploration	0/0	Bennett 1977
B-17	U.S. Energy Corp. Roys Point to Dixie Valley	1/4	Botti 1985
B-17	1-94/4 Pits from 8 Miles East of Salt Wells	2/1	Bunch 1982a
B-17	1-149/U.S. 50 Betterment	0/0	Bunch *et al.* 1982b
B-17	1-40/Geothermal Resource Exploration 030-31	0/0	Hatoff 1977
B-17	1-234/Lizard Study Plot Fence - Dixie Valley	1/0	Hatoff 1978
B-17	1-196/Hunt Energy NOI N3-07-79	0/0	Hatoff 1979a
B-17	1-237/LaBeau-Navy Fence	1/0	Hatoff 1979b
B-17	1-213/Proposed Material Sale, Bell Canyon	0/0	Hatoff 1980
B-17	Electronics Warfare, Frenchman	1/0	Hatoff 1982
B-17	1-159/Frenchman Flat Electronic Warfare	0/0	Hatoff 1983
B-17	1-169/North Well Holding Field (JDR-6334)	0/0	Hatoff 1984
B-17	Frenchman Pasture Fence (JDR 6358)	0/1	Hatoff 1985
B-17	Chalk Mountain Pipeline Extension (JDR 6453)	0/0	Hatoff 1987
B-17	1-202/Bell Canyon Guzzler No. 1	0/0	Jacquet & Bardwell 1979
B-17	Electronic Warfare Range, etc.	7/1	Juell 1987
B-17	1-223/Frenchman Stn Storage & Facilities	0/0	Mabe 1980
B-17	1-123/Bell Canyon Drift Fence (JDR 6164)	0/0	Mabe 1981a
B-17	1-124/East Frenchman Stock Water Storage	0/0	Mabe 1981b
B-17	1-144/Black Knob Pipeline No. 2 (JDR 6199)	0/0	O'Brien 1982
B-17	1-150/Electronic Warfare Range Site	0/0	Pope 1982
B-17	Right-of-Way Reservation, N-45136	0/0	Pope 1987
B-17	1-197/SCS-BLM Soil Test Pits, Fairview Valley	0/0	Ratzlaff 1980
B-17	1-5-1/Material Site Exploration Site Ch 197	N/A	Rusco 1975a
B-17	1-5-2,75/Dixie Valley ROW	2/0	Rusco 1975b
B-17	Oxbow Geothermal Dixie Valley Alternate Route	1/3	Sutton 1985

TABLE G-2
CULTURAL RESOURCES SURVEYS CONDUCTED AT NAS FALLON

Area	NSM Number/Project Name	Sites/ Isolates	Reference
B-17	Proposed Mock Airfield Complex	0/3	TetraTech 1992a
B-17	1-225/23 Proposed Geothermal Wells	0/0	Toll 1980
B-17	Oxbow R/W Realignment	0/0	Juell 1987a
B-17	EW Range Improvements	3/0	Intermountain Rsch 1987
DVA	US 50 Betterment	0/0	Seldomridge 1986
DVA	Grimes Point to Sand Spring	0/0	Matranga 1982
DVA	US 50 Betterment Labou Flat	0/0	Matranga 1980
DVA	SW Frenchman Stock Water	0/0	Mabe 1984
DVA	Bell Mountain Mine	0/0	Armentrout 1981
DVA	Oxbow Geothermal Staging Areas	1/0	Simmons 1987
DVA	EW Threat Simulators	0/0	Drews 1985
DVA	Oxbow Access Roads	0/0	Pierce 1987

TABLE G-3
LIST OF SITES IN SAMPLED AREAS OF TOEDOKADO TERRITORY (ON NAVY LANDS)
ARCHEOLOGICAL SITE PREDICTION MODEL

Site Number		Survey Year	Site Class	Site Description	National Register Status
BLM CrNV 81-	Temp. Field No.				
3532	7-1*	1994	Prehistoric	Hist. Habitation and Lithic/ Groundstone	Not Eligible
4613	3-1	1994	Prehistoric	Lithic Scatter	Not Eligible
4614	3-2	1994	Prehistoric	Lithic Scatter	Not Eligible
4615	3-3	1994	Prehistoric	Lithic Scatter	Not Eligible
4616	3-4	1994	Prehistoric	Lithic Scatter	Not Eligible
4617	3-5	1994	Prehistoric	Lithic Scatter	Not Eligible
4618	4-1	1994	Prehistoric	Lithic/Groundstone Scatter	Not Eligible
4619	4-2	1994	Prehistoric	Lithic/Groundstone Scatter w/features	Not Eligible
4620	4-3	1994	Prehistoric	Lithic/Groundstone Scatter	Not Eligible
4621	4-4	1994	Prehistoric	Groundstone Scatter	Not Eligible
4622	4-5	1994	Prehistoric	Lithic/Groundstone Scatter	Not Eligible
4623	4-6*	1994	Prehistoric	Lithic/Groundstone Scatter w/features	Eligible
4624	5 - 1	1994	Prehistoric	Lithic/Groundstone Scatter w/features	Not Eligible
4625	5-2	1994	Prehistoric	Lithic Scatter	Not Eligible
4626	5-3	1994	Prehistoric	Lithic/Groundstone Scatter	Not Eligible
4627	5-4	1994	Prehistoric	Lithic/Groundstone Scatter w/features	Not Eligible
4628	4-5	1994	Prehistoric	Lithic Scatter	Not Eligible
4629	5-6	1994	Prehistoric	Lithic Scatter	Not Eligible
4630	43-2	1994	Historic	Historical Mining	Not Eligible
4631	10 - 1	1994	Prehistoric	Lithic Scatter/Quarry	Not Eligible
4632	11 - 1	1994	Prehistoric	Lithic Scatter/Quarry	Not Eligible
4633	11 - 2	1994	Prehistoric	Lithic Scatter/Quarry	Not Eligible
4634	11 - 3	1994	Prehistoric	Lithic Scatter	Not Eligible
4635	11 - 4	1994	Prehistoric	Lithic Scatter/Quarry	Not Eligible

TABLE G-3
LIST OF SITES IN SAMPLED AREAS OF TOEDOKADO TERRITORY (ON NAVY LANDS) ARCHEOLOGICAL SITE PREDICTION MODEL

Site Number		Survey Year	Site Class	Site Description	National Register Status
BLM CrNV 81-	Temp. Field No.				
4636	11 - 5	1994	Prehistoric	Lithic Scatter	Eligible
4637	11 - 6	1994	Prehistoric	Lithic Scatter	Not Eligible
4638	11 - 7	1994	Prehistoric	Lithic Scatter	Not Eligible
4639	11 - 8	1994	Prehistoric	Lithic Scatter	Not Eligible
4640	19-1	1994	Prehistoric	Lithic Scatter	Not Eligible
4641	22-1	1994	Prehistoric	Lithic Scatter	Not Eligible
4642	23-1	1994	Historic	Historical Mining	Not Eligible
4643	24-1	1994	Historic	Historical Scatter	Not Eligible
4644	24-2	1994	Prehistoric	Lithic Scatter	Not Eligible
4645	24-3	1994	Prehistoric	Lithic/Groundstone Scatter w/features	Eligible
4646	24-4	1994	Prehistoric	Lithic/Groundstone Scatter	Not Eligible
4647	24-5	1994	Prehistoric	Lithic Scatter	Not Eligible
4648	24-6	1994	Prehistoric	Lithic Scatter	Not Eligible
4649	24-7	1994	Prehistoric		Eligible
4650	24-8	1994	Prehistoric	Lithic Scatter	Not Eligible
4651	25-1	1994	Prehistoric	Lithic Scatter	Not Eligible
4652	25-2	1994	Prehistoric	Lithic/Groundstone Scatter/Quarry	Not Eligible
4653	25-3	1994	Historic	Lithic Scatter/Quarry	Not Eligible
4654	25-4	1994	Prehistoric	Lithic Scatter	Not Eligible
4655	25-5	1994	Prehistoric/	Lithic/Groundstone Scatter	Eligible
4656	25-6	1994	Prehistoric	Lithic Scatter	Not Eligible
4657	25-7	1994	Prehistoric	Lithic Scatter	Not Eligible
4658	25-8	1994	Prehistoric	Lithic Scatter	Not Eligible
4659	25-9	1994	Prehistoric	Lithic Scatter	Not Eligible
4660	25-10	1994	Prehistoric	Lithic Scatter/Quarry	Not Eligible
4661	25-11	1994	Prehistoric	Lithic Scatter/Quarry	Not Eligible

TABLE G-3
LIST OF SITES IN SAMPLED AREAS OF TOEDOKADO TERRITORY (ON NAVY LANDS)
ARCHEOLOGICAL SITE PREDICTION MODEL

Site Number		Survey Year	Site Class	Site Description	National Register Status
BLM CrNV 81-	Temp. Field No.				
4662	25-12	1994	Prehistoric	Lithic Scatter/Quarry	Not Eligible
4663	26-1	1994	Prehistoric	Lithic Scatter	Not Eligible
4664	28-1	1994	Prehistoric	Lithic Scatter	Not Eligible
4665	28-2	1994	Prehistoric	Lithic Scatter	Eligible
4666	30-1	1994	Prehistoric	Lithic Scatter	Not Eligible
4667	30-2	1994	Prehistoric	Lithic Scatter	Not Eligible
4668	30-3	1994	Prehistoric	Lithic Scatter	Not Eligible
4669	30-4	1994	Prehistoric	Lithic Scatter	Not Eligible
4670	34-1	1994	Historic	Historical Habitation Site	Not Eligible
4671	39-1	1994	Historic	Historical Scatter	Not Eligible
4672	39-2	1994	Prehistoric	Lithic Scatter	Not Eligible
4673	41-1	1994	Historic	Historical Mining	Not Eligible
4674	43-1	1994	Historic	Historical Mining	Not Eligible
4712	1-1	1993	Prehistoric	Lithic Scatter	Not Eligible
4713	1-2	1993	Prehistoric	Isolate	Not Eligible
4714	1-3	1993	Prehistoric	Isolate	Not Eligible
4715	1-4	1993	Prehistoric	Isolate	Not Eligible
4716	1-5	1993	Prehistoric	Lithic Scatter	Not Eligible
4717	2-1	1993	Prehistoric	Lithic Scatter	Not Eligible
4718	2-2	1993	Prehistoric	Lithic Scatter	Not Eligible
4719	2-3	1993	Prehistoric	Lithic Scatter	Not Eligible
4720	3-1	1993	Prehistoric	Lithic/Groundstone Scatter w/features	Eligible
4721	3-2	1993	Prehistoric	Lithic/Groundstone Scatter w/features	Eligible
4722	3-3	1993	Prehistoric	Lithic/Groundstone Scatter	Eligible
4723	8-1	1993	Prehistoric	Lithic/Groundstone Scatter	Not Eligible
4724	8-2	1993	Prehistoric	Isolate	Not Eligible

TABLE G-3
LIST OF SITES IN SAMPLED AREAS OF TOEDOKADO TERRITORY (ON NAVY LANDS)
ARCHEOLOGICAL SITE PREDICTION MODEL

Site Number		Survey Year	Site Class	Site Description	National Register Status
BLM CrNV 81-	Temp. Field No.				
4725	10-1	1993	Prehistoric	Isolate	Not Eligible
4726	11-1	1993	Prehistoric	Lithic Scatter	Not Eligible
4727	11-2	1993	Prehistoric	Isolate	Not Eligible
4728	11-3	1993	Prehistoric	Lithic Scatter	Not Eligible
4729	11-4	1993	Prehistoric	Lithic Scatter	Not Eligible
4730	11-5	1993	Prehistoric	Lithic Scatter	Not Eligible
4731	12-1	1993	Prehistoric	Lithic Scatter	Not Eligible
4732	23-2	1994	Historic	Historical Mining	Not Eligible
	1-IF1	1993	Historic	Isolate	Not Eligible
	1-IF2	1993	Prehistoric	Isolate	Not Eligible
	2-IF1	1993	Prehistoric	Isolate	Not Eligible
	2-IF2	1993	Prehistoric	Isolate	Not Eligible
	2-IF3	1993	Prehistoric	Isolate	Not Eligible
	2-IF4	1993	Prehistoric	Isolate	Not Eligible
	2-IF5	1993	Prehistoric	Isolate	Not Eligible
	3-IF1	1993	Prehistoric	Isolate	Not Eligible
	3-IF2	1993	Prehistoric	Isolate	Not Eligible
	3-IF3		Prehistoric	Isolate	Not Eligible
	3-IF4	1993	Prehistoric	Isolate	Not Eligible
	3-IF5	1993	Prehistoric	Isolate	Not Eligible
	3-IF6	1993	Prehistoric	Isolate	Not Eligible
	3-IF7	1993	Prehistoric	Isolate	Not Eligible
	3-IF8		Prehistoric	Isolate	Not Eligible
	3-IF9		Prehistoric	Isolate	Not Eligible
	3-IF10		Prehistoric	Isolate	Not Eligible
	3-IF11		Prehistoric	Isolate	Not Eligible
	3-IF12		Prehistoric	Isolate	Not Eligible

TABLE G-3
LIST OF SITES IN SAMPLED AREAS OF TOEDOKADO TERRITORY (ON NAVY LANDS) ARCHEOLOGICAL SITE PREDICTION MODEL

Site Number		Survey Year	Site Class	Site Description	National Register Status
BLM CrNV 81-	Temp. Field No.				
	3-IF13		Prehistoric	Isolate	Not Eligible
	3-IF14		Prehistoric	Isolate	Not Eligible
	4-IF1		Prehistoric	Isolate	Not Eligible
	4-IF2		Prehistoric	Isolate	Not Eligible
	4-IF3		Prehistoric	Isolate	Not Eligible
	4-IF4		Prehistoric	Isolate	Not Eligible
	4-IF5		Prehistoric	Isolate	Not Eligible
	4-IF6		Prehistoric	Isolate	Not Eligible
	4-IF7	1993	Prehistoric	Isolate	Not Eligible
	4-IF8		Prehistoric	Isolate	Not Eligible
	4-IF9		Prehistoric	Isolate	Not Eligible
	4-IF10		Prehistoric	Isolate	Not Eligible
	5-IF1		Prehistoric	Isolate	Not Eligible
	5-IF2		Prehistoric	Isolate	Not Eligible
	5-IF3		Prehistoric	Isolate	Not Eligible
	5-IF4		Prehistoric	Isolate	Not Eligible
	5-IF5		Prehistoric	Isolate	Not Eligible
	5-IF6		Prehistoric	Isolate	Not Eligible
	6-IF1	1993	Prehistoric	Isolate	Not Eligible
	7-IF1	1993	Prehistoric	Isolate	Not Eligible
	7-IF2	1993	Prehistoric	Isolate	Not Eligible
	7-IF3	1993	Prehistoric	Isolate	Not Eligible
	7-IF4	1993	Prehistoric	Isolate	Not Eligible
	8-IF1	1993	Prehistoric	Isolate	Not Eligible
	8-IF2	1993	Prehistoric	Isolate	Not Eligible
	8-IF3	1993	Prehistoric	Isolate	Not Eligible
	10-IF1	1993	Prehistoric	Isolate	Not Eligible

TABLE G-3
LIST OF SITES IN SAMPLED AREAS OF TOEDOKADO TERRITORY (ON NAVY LANDS) ARCHEOLOGICAL SITE PREDICTION MODEL

Site Number		Survey Year	Site Class	Site Description	National Register Status
BLM CrNV 81-	Temp. Field No.				
	10-IF2	1993	Prehistoric	Isolate	Not Eligible
	10-IF3	1993	Prehistoric	Isolate	Not Eligible
	10-IF4	1993	Prehistoric	Isolate	Not Eligible
	10-IF5	1993	Prehistoric	Isolate	Not Eligible
	10-IF6	1993	Prehistoric	Isolate	Not Eligible
	10-IF7	1993	Prehistoric	Isolate	Not Eligible
	10-IF8	1993	Prehistoric	Isolate	Not Eligible
	10-IF9	1993	Prehistoric	Isolate	Not Eligible
	11-IF1		Prehistoric	Isolate	Not Eligible
	11-IF2	1993	Prehistoric	Isolate	Not Eligible
	11-IF3	1993	Prehistoric	Isolate	Not Eligible
	11-IF4	1993	Prehistoric	Isolate	Not Eligible
	11-IF5	1993	Prehistoric	Isolate	Not Eligible
	11-IF6		Prehistoric	Isolate	Not Eligible
	11-IF7		Prehistoric	Isolate	Not Eligible
	11-IF9		Prehistoric	Isolate	Not Eligible
	11-IF10		Prehistoric	Isolate	Not Eligible
	11-IF11		Historic	Isolate	Not Eligible
	12-IF1	1993	Prehistoric	Isolate	Not Eligible
	12-IF2	1993	Prehistoric	Isolate	Not Eligible
	12-IF3	1993	Prehistoric	Isolate	Not Eligible
	13-IF1	1993	Prehistoric	Isolate	Not Eligible
	13-IF2	1993	Prehistoric	Isolate	Not Eligible
	16-IF1	1994	Prehistoric	Isolate	Not Eligible
	16-IF2	1994	Prehistoric	Isolate	Not Eligible
	19-IF1		Prehistoric	Isolate	Not Eligible
	22-IF1		Historic	Isolate	Not Eligible

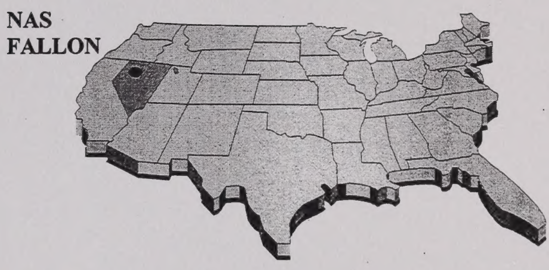
TABLE G-3
LIST OF SITES IN SAMPLED AREAS OF TOEDOKADO TERRITORY (ON NAVY LANDS) ARCHEOLOGICAL SITE PREDICTION MODEL

Site Number		Survey Year	Site Class	Site Description	National Register Status
BLM CrNV 81-	Temp. Field No.				
	22-IF2		Prehistoric	Isolate	Not Eligible
	22-IF3		Prehistoric	Isolate	Not Eligible
	23-IF1		Prehistoric	Isolate	Not Eligible
	23-IF2		Historic	Isolate	Not Eligible
	24-IF1		Prehistoric	Isolate	Not Eligible
	24-IF2		Prehistoric	Isolate	Not Eligible
	24-IF3		Prehistoric	Isolate	Not Eligible
	24-IF4		Prehistoric	Isolate	Not Eligible
	24-IF5		Prehistoric	Isolate	Not Eligible
	24-IF6		Prehistoric	Isolate	Not Eligible
	24-IF7		Historic	Isolate	Not Eligible
	24-IF8		Prehistoric	Isolate	Not Eligible
	24-IF9		Prehistoric	Isolate	Not Eligible
	24-IF10		Prehistoric	Isolate	Not Eligible
	24-IF11		Prehistoric	Isolate	Not Eligible
	24-IF12		Prehistoric	Isolate	Not Eligible
	25-IF1		Historic	Isolate	Not Eligible
	25-IF2		Historic	Isolate	Not Eligible
	27-IF1		Prehistoric	Isolate	Not Eligible
	28-IF1		Prehistoric	Isolate	Not Eligible
	29-IF1		Prehistoric	Isolate	Not Eligible
	29-IF2		Historic	Isolate	Not Eligible
	30-IF1		Prehistoric	Isolate	Not Eligible
	30-IF2		Prehistoric	Isolate	Not Eligible
	30-IF3		Prehistoric	Isolate	Not Eligible
	30-IF4		Prehistoric	Isolate	Not Eligible
	30-IF5		Prehistoric	Isolate	Not Eligible

TABLE G-3
LIST OF SITES IN SAMPLED AREAS OF TOEDOKADO TERRITORY (ON NAVY LANDS) ARCHEOLOGICAL SITE PREDICTION MODEL

Site Number		Survey Year	Site Class	Site Description	National Register Status
BLM CrNV 81-	Temp. Field No.				
	31-IF1		Prehistoric	Isolate	Not Eligible
	31-IF2		Historic	Isolate	Not Eligible
	34-IF1		Prehistoric	Isolate	Not Eligible
	34-IF2		Historic	Isolate	Not Eligible
	34-IF3		Prehistoric	Isolate	Not Eligible
	34-IF4		Historic	Isolate	Not Eligible
	37-IF1		Prehistoric	Isolate	Not Eligible
	37-IF2		Historic	Isolate	Not Eligible
	38-IF1		Historic	Isolate	Not Eligible
	38-IF2		Historic	Isolate	Not Eligible
	39-IF1		Historic	Isolate	Not Eligible
	39-IF2		Historic	Isolate	Not Eligible
	39-IF3		Historic	Isolate	Not Eligible
	39-IF4		Historic	Isolate	Not Eligible
	41-IF1		Historic	Isolate	Not Eligible
	42-IF1	1994	Prehistoric	Isolate	Not Eligible
	42-IF2	1994	Historic	Isolate	Not Eligible
	42-IF3	1994	Historic	Isolate	Not Eligible
	42-IF4	1994	Historic	Isolate	Not Eligible
	42-IF5	1994	Historic	Isolate	Not Eligible
	42-IF6	1994	Historic	Isolate	Not Eligible
	42-IF7	1994	Historic	Isolate	Not Eligible
	43-IF1		Prehistoric	Isolate	Not Eligible
	43-IF2		Prehistoric	Isolate	Not Eligible
	44-IF1	1994	Prehistoric	Isolate	Not Eligible
	44-IF2	1994	Prehistoric	Isolate	Not Eligible

Source: Intermountain Research 1995, 1997
* site previously recorded



APPENDIX H

MINING CLAIMS

APPENDIX H MINING CLAIMS

In Nevada, all patented and unpatented mining claims must be filed with the Bureau of Land Management State Office in Reno and the county in which the claim was made. The BLM State Office maintains a database of mining claims that includes the claim name, the current status of the claim, its location date, and its location by township, range, section, and subdivision. Information on the current number and location of patented and unpatented mining claims was obtained from this database.

Data on township, range, section, and subdivision were compared to the withdrawal area to determine which claims fell within the proposed land withdrawal footprint. The location date was used to determine which claims were located after the lands were closed to mineral entry. An assessment was performed to determine whether claims are located on land segregated in 1982 or land segregated in 1992. Finally, the claim was compared to the proposed withdrawal area to determine its location in reference to the ranges and Category A and B lands. Table H-1 lists the patented claims and Table H-2 list the unpatented claims located in the withdrawal area. The general locations of the patented and unpatented claims thought to be active in the entire withdrawal area are shown on Figure H-1.

TABLE H-1. PATENTED MINING CLAIMS

Township	Range	Section	Claim Name	Patent Number	M.S. Number	Location/ Category
Alternatives I, II, and III						
15N	34E	7,18	Bluff Gold Coin Gold Coin 1 Gold Coin 2 Fraction	289653	3914	B-17/ Category A
16N	34E	17	Detroit Tiger	47231	2745	B-17/ Category A
16N	34E	17	Florence #3 Blue Bell Little Fellow	47230	2668	B-17/ Category A
16N	34E	17	Ohio Ohio No. 1	83149	3206	B-17/ Category A
16N	34E	17	Great Falls	149254	3752	B-17/ Category A
16N	34E	16	Lookout No. 2	90643	3383	B-17/ Category A
Alternatives I and III						
19N	34E	32	Golden Dawn No. 2 Golden Dawn No. 3	17330	3671	Dixie Valley/ Category B
Alternative I						
19N	34E	36	Bumble Bee Grey Horse Grey Horse 1 Grey Horse 2 Triangle Fraction Kingstone	252474	3425	Dixie Valley/ Category B
19N	34E(35E)	36(31)	Spider Wasp Tony Pah Long Nel Last Chance	29199	3064	Dixie Valley/ Category B
19N	34E(35E)	36(31)	Silver Tip Valley View Pan Handle Yellow Jacket	104739	3398	Dixie Valley/ Category B
19N	34E(35E)	25,36(30)	Navadan Little Witch	104739	3398	Dixie Valley/ Category B
19N	34E(35E)	25(30)	Lost Chord King Midas King Midas 1 King Midas 2 King Midas 3	263382	3885	Dixie Valley/ Category B
19N	34E(35E)	25(30)	Great Eastern 1 Great Eastern 3 Great Eastern 4	32958	3122	Dixie Valley/ Category B

Source: Nevada State Office of the Bureau of Land Management, Reno, Mining Claim Database

TABLE H-2. UNPATENTED MINING CLAIMS

Town-ship	Range	Section	Subdivision	Serial Number	Claim Name	Location Date	Segregation Date	Status	Location/ Category
19N	35E	30	SE	71571	Treasure Hill #1064	6/6/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	30(31)	SE(NE)	71572	Treasure Hill #1065	5/16/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	31	NE	75282	Treasure Hill #1066	6/6/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	31	NE	75283	Treasure Hill #1067	6/6/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	30(31)	SE(NE,SE)	71573	Treasure Hill #1068	5/16/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	30	SE	71575	Treasure Hill #1070	6/6/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	31	NE	75284	Treasure Hill #1072	6/6/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	31	NE	75285	Treasure Hill #1073	6/6/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	30(31)	SE(NE)	75286	Treasure Hill #1074	5/16/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	30	SE	75287	Treasure Hill #1075	6/7/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	30	SE,SW	75288	Treasure Hill #1076	6/7/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	30(31)	SE,SW(NE,NW)	75289	Treasure Hill #1077	5/16/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	31	NE,NW	75290	Treasure Hill #1078	6/6/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	30	SW	75294	Treasure Hill #1082	6/7/79	9/20/82	Rental paid 1997	DV/B^1
19N	35E	30	SW	75295	Treasure Hill #1083	6/7/79	9/20/82	Rental paid 1997	DV/B^1
19N	34E	25(30)	SE(SW)	75301	Treasure Hill #1097	6/7/79	9/20/82	Rental paid 1997	DV/B^2
17N	27E	11	NW,SW	100065	Wildhorse #2	8/28/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	11	NW	100066	Wildhorse #3	8/28/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	11	NW	100067	Wildhorse #4	8/28/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	10(11)	NE,SE(NW,SW)	100071	Wildhorse #8	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	10(11)	SE(NW,SW)	100072	Wildhorse #9	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	10(11)	SE(NW,SW)	100073	Wildhorse #10	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	11	SW	100074	Wildhorse #11	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	11	SW	100075	Wildhorse #12	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	11(14)	SW(NW)	100076	Wildhorse #13	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	14	NW	100077	Wildhorse #14	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	14	NW,SW	100078	Wildhorse #15	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	14	SW	100079	Wildhorse #16	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	14(15)	NW,SW(NE,SE)	100080	Wildhorse #17	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	14(15)	SW(SE)	100081	Wildhorse #18	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	15	SE	100082	Wildhorse #19	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	14	SW	100083	Wildhorse #20	10/24/52	9/20/82	Small miner certification filed in 1996	B-16/B^1
17N	27E	11	NW,NE,SW	100064	Wildhorse #1	8/28/52	9/20/82	Small miner certification filed in 1996	B-16/A^1

Town-ship	Range	Section	Subdivision	Serial Number	Claim Name	Location Date	Segregation Date	Status	Location/ Category
17N	27E	11	ALL	100068	Wildhorse #5	8/28/52	9/20/82	Small miner certification filed in 1996	B-16/A[1]
15N	34E	31	SE	66425	Lucky Four #1	3/1/70	9/20/82	Small miner certification filed in 1996	B-17/A
16N	34E	16	NW	628404	Red Baron	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	NE,NW	628405	Black Hawk	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	NW	628406	Inca	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	NW	628408	Red Baron #1	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	NE,NW	628409	Peggy	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628414	Silver Bow #4	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628416	Aztec #2	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628417	Aztec #3	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628418	Silver Hill	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628419	Maya #1	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628420	Maya #2	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628421	Nancy	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628422	Lode King	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628423	Hard Rock	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	16	SW	628424	Jan	7/29/91	9/8/92	Deferment granted 1996; deferment request 1997	B-17/A
16N	34E	8	SE	628399	Toltec #1	7/29/91	9/8/92	Deferment requested 1996	B-17/A
16N	34E	8(9)	SE(SW)	628400	Toltec #2	7/29/91	9/8/92	Deferment requested 1996	B-17/A
16N	34E	9	SW	628401	Pick Handle	7/29/91	9/8/92	Deferment requested 1996	B-17/A

Source: Nevada State Office of the Bureau of Land Management, Reno, Mining Claim Database

Notes: Data in parentheses indicates claims located in more than one section or subdivision.

DV = Dixie Valley

[1] This claim is located on land to be withdrawn under Alternative I only.

[2] This claim is located on land to be withdrawn under Alternatives I and III only.

The Payne and Baughman claims being contested have been declared null and void.

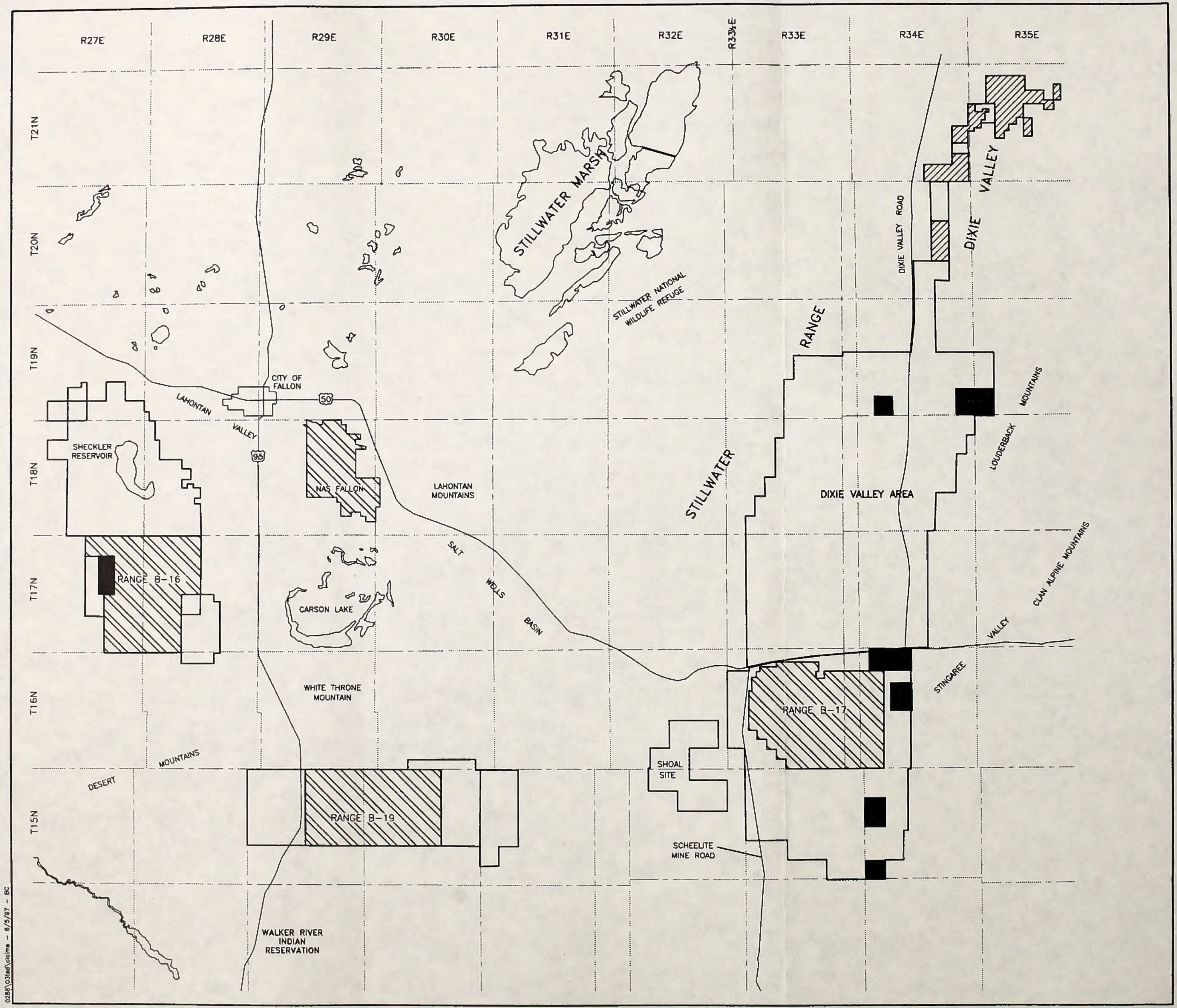
TABLE H-2. UNPATENTED MINING CLAIMS

Serial Number	Claim Name	Owner
71571	Treasure Hill #1064	Clark Wood
71572	Treasure Hill #1065	Covecrest Properties
75282	Treasure Hill #1066	Lynn Erickson
75283	Treasure Hill #1067	Lynn Erickson
71573	Treasure Hill #1068	William Jackson
71575	Treasure Hill #1070	Lynn Erickson
75284	Treasure Hill #1072	Jan Prahm
75285	Treasure Hill #1073	Lynn Erickson
75286	Treasure Hill #1074	Lynn Erickson
75287	Treasure Hill #1075	Lynn Erickson
75288	Treasure Hill #1076	Lynn Erickson
75289	Treasure Hill #1077	Lynn Erickson
75290	Treasure Hill #1078	Lynn Erickson
75294	Treasure Hill #1082	Lynn Erickson
75295	Treasure Hill #1083	Lynn Erickson (I think)
75301	Treasure Hill #1097	Lynn Erickson (I think)
100065	Wildhorse #2	Stephen Campbell
100066	Wildhorse #3	Stephen Campbell
100067	Wildhorse #4	Stephen Campbell
100071	Wildhorse #8	Stephen Campbell
100072	Wildhorse #9	Stephen Campbell
100073	Wildhorse #10	Stephen Campbell
100074	Wildhorse #11	Stephen Campbell
100075	Wildhorse #12	Stephen Campbell
100076	Wildhorse #13	Stephen Campbell
100077	Wildhorse #14	Stephen Campbell
100078	Wildhorse #15	Stephen Campbell
100079	Wildhorse #16	Stephen Campbell
100080	Wildhorse #17	Stephen Campbell
100081	Wildhorse #18	Stephen Campbell
100082	Wildhorse #19	Stephen Campbell
100083	Wildhorse #20	Stephen Campbell
100064	Wildhorse #1	Stephen Campbell
100068	Wildhorse #5	Stephen Campbell
66425	Lucky Four #1	Clive Gurr
628404	Red Baron	Nick Holden/BB McMahen
628405	Black Hawk	Nick Holden/BB McMahen
628406	Inca	Nick Holden/BB McMahen
628408	Red Baron #1	Nick Holden/BB McMahen
628409	Peggy	Nick Holden/BB McMahen
628414	Silver Bow #4	Nick Holden/BB McMahen
628416	Aztec #2	Nick Holden/BB McMahen
628417	Aztec #3	Nick Holden/BB McMahen
628418	Silver Hill	Nick Holden/BB McMahen
628419	Maya #1	Nick Holden/BB McMahen
628420	Maya #2	Nick Holden/BB McMahen

Serial Number	Claim Name	Owner
628421	Nancy	Nick Holden/BB McMahen
628422	Lode King	Nick Holden/BB McMahen
628423	Hard Rock	Nick Holden/BB McMahen
628424	Jan	Nick Holden/BB McMahen
628399	Toltec #1	Nick Holden/BB McMahen
628400	Toltec #2	Nick Holden/BB McMahen
628401	Pick Handle	Nick Holden/BB McMahen

Many of the Treasure Hill properties are owned by different groups of people. Lynn Erickson's name is the most common.

The Payne and Baughman claims being contested have been declared null and void.



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LEGEND:

▧ NAS Fallon Training Ranges

■ General Location of Patented and Unpatented Mining Claims

▨ Navy-owned land in Dixie Valley

N

0 2.5 5
1"=5MI.
(APPROXIMATE)

The figure depicts the general location of patented and unpatented mining claims believed to be active in the withdrawal area. For more specific locations, refer to Tables H-1 and H-2.

General Location of Patented and Unpatented Mining Claims

NAS Fallon, Nevada

Figure H-1

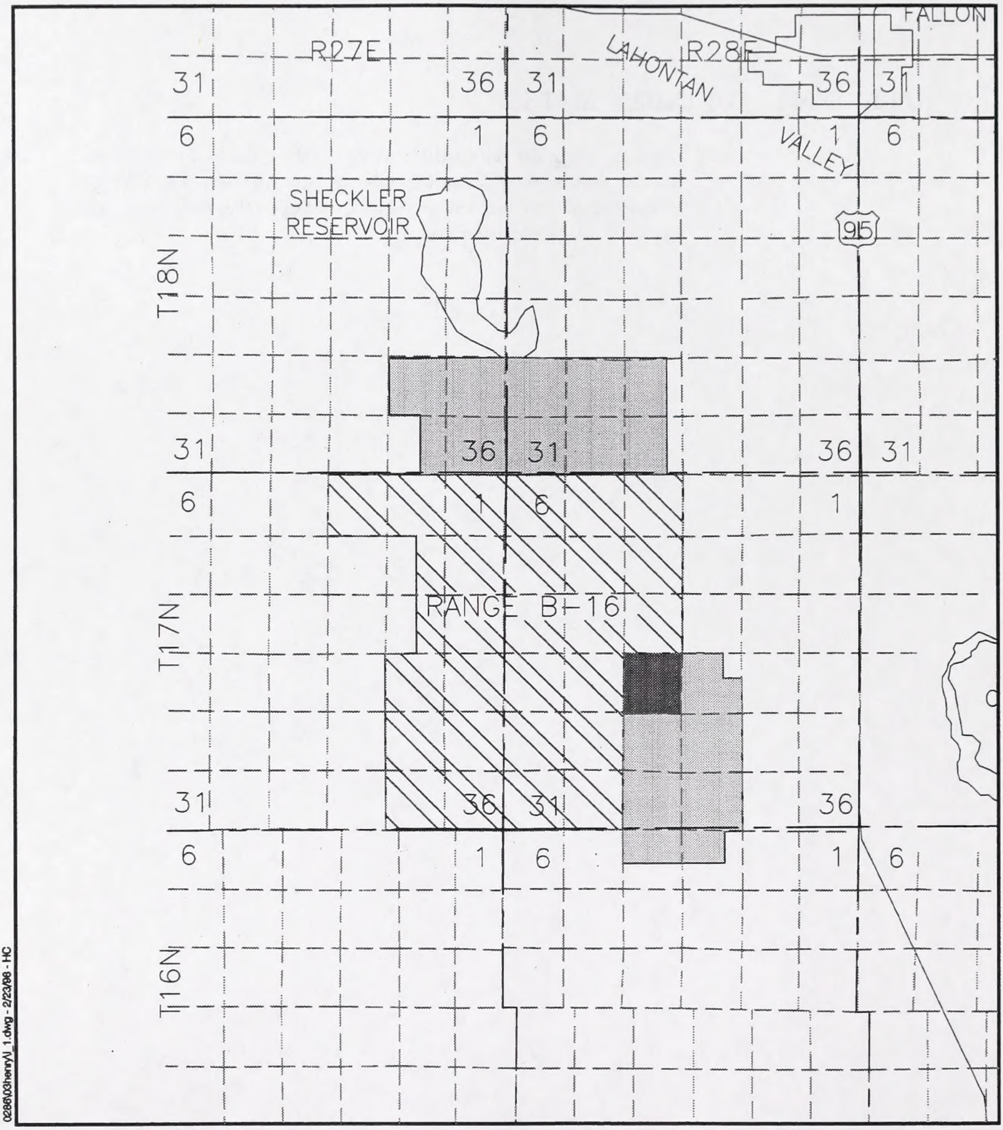
Source: Tetra Tech

APPENDIX I

DETAILED MAPS

APPENDIX I DETAILED MAPS

Appendix I provides more detailed graphics of the withdrawal footprint for the five areas proposed for withdrawal—the B-16 withdrawal area, the B-17 withdrawal area, the B-19 withdrawal area, the Dixie Valley withdrawal area, and the shoal site withdrawal area.



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The preferred alternative would withdraw approximately 10,400 acres. About 640 acres would be managed as Category A land.

Legend:

▓ Category A Land (Restricted Use)

░ Category B Land (Regulated Development)

▨ Existing Range B-16

-- Section Boundaries

N

0 1 2

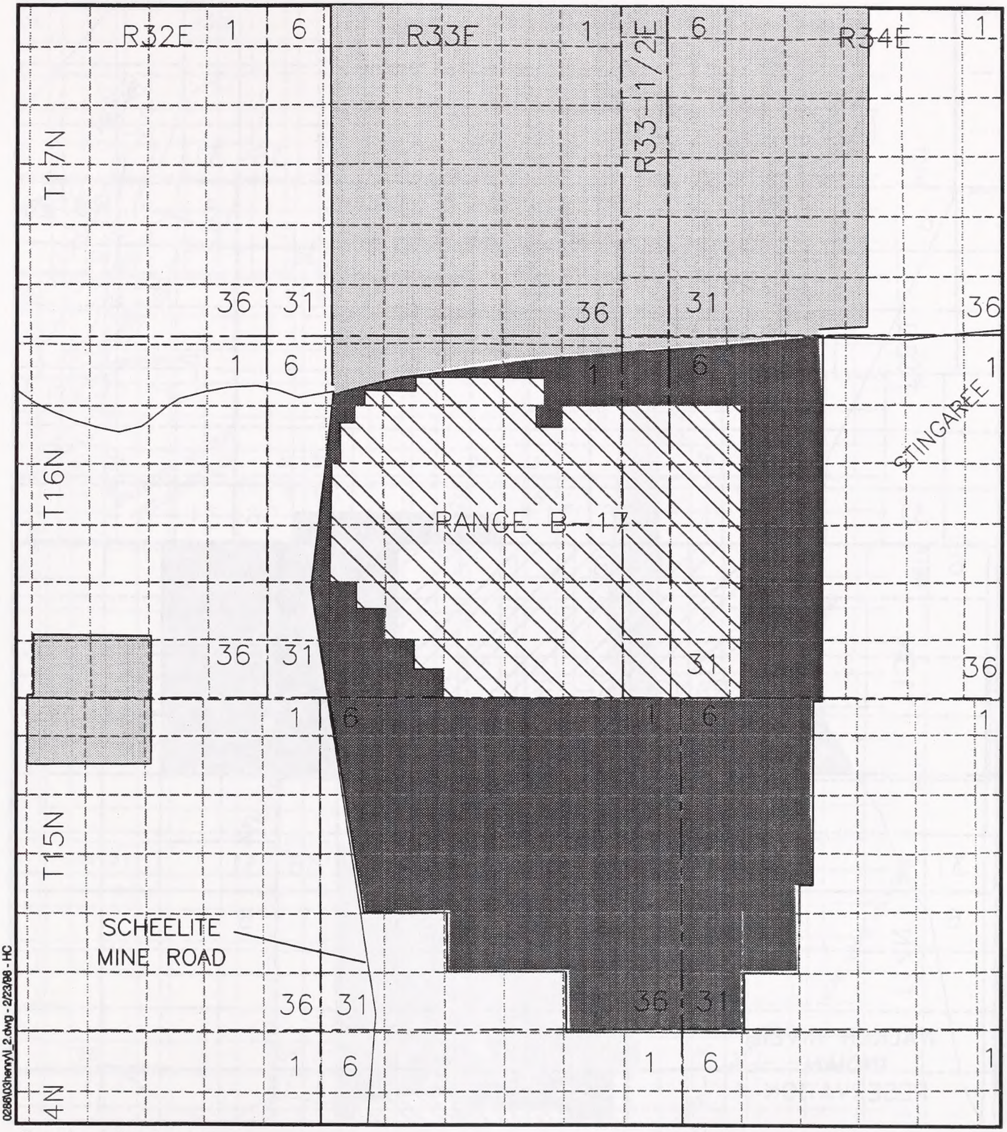
Approximate 1" = 1 mi.

Source: US Navy, 1996

B-16 Withdrawal Area

NAS Fallon, Nevada

Figure I-1



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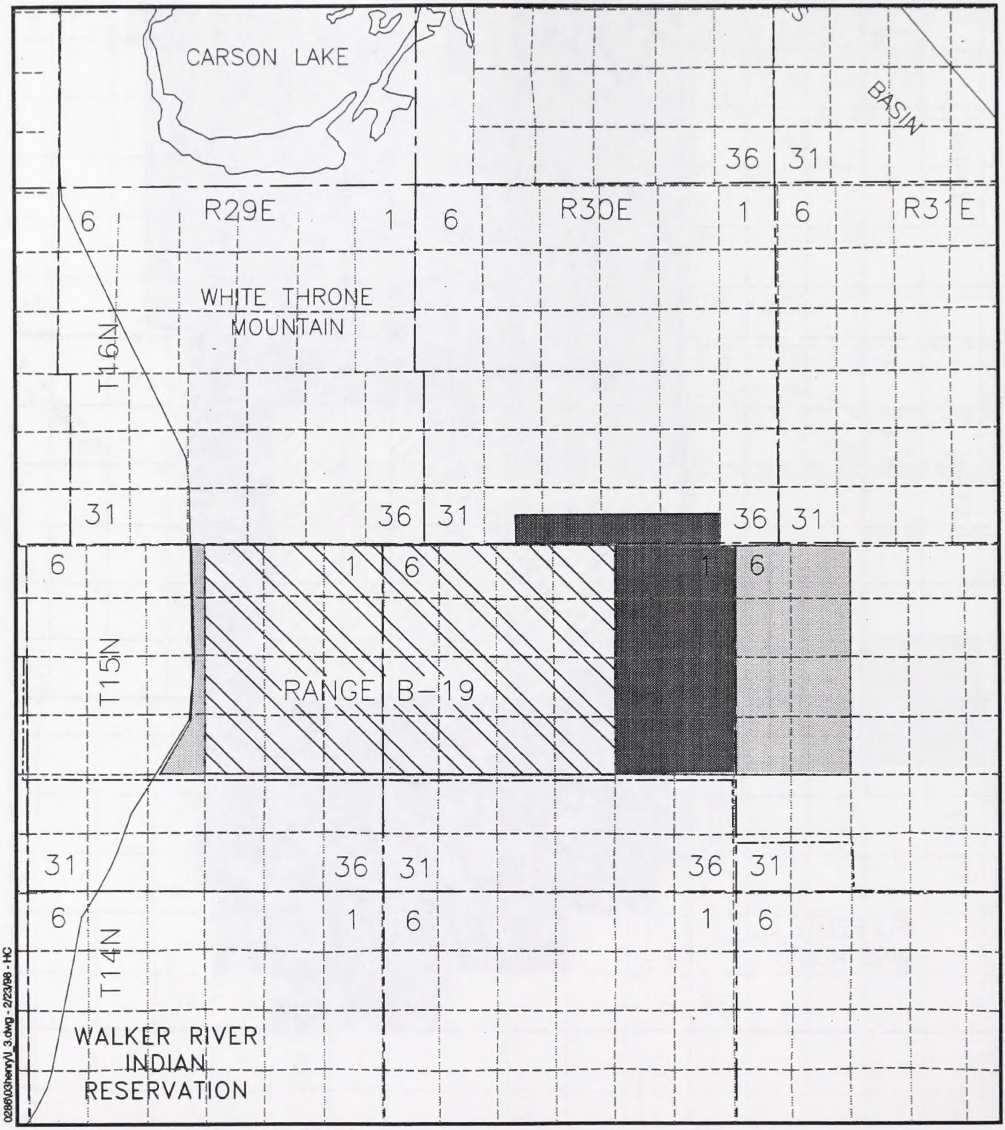
The preferred alternative would withdraw approximately 33,400 acres. About 33,300 acres would be managed as Category A land.

Source: US Navy, 1996

B-17 Withdrawal Area

NAS Fallon, Nevada

Figure I-2



The preferred alternative would withdraw approximately 12,200 acres. About 6,400 acres would be managed as Category A land.

Legend:

■ Category A Land (Restricted Use)

░ Category B Land (Regulated Development)

— · — Walker River Indian Reservation Boundary

▨ Existing Range B-19

– – –┼– – – Section Boundaries

N

0 1 2

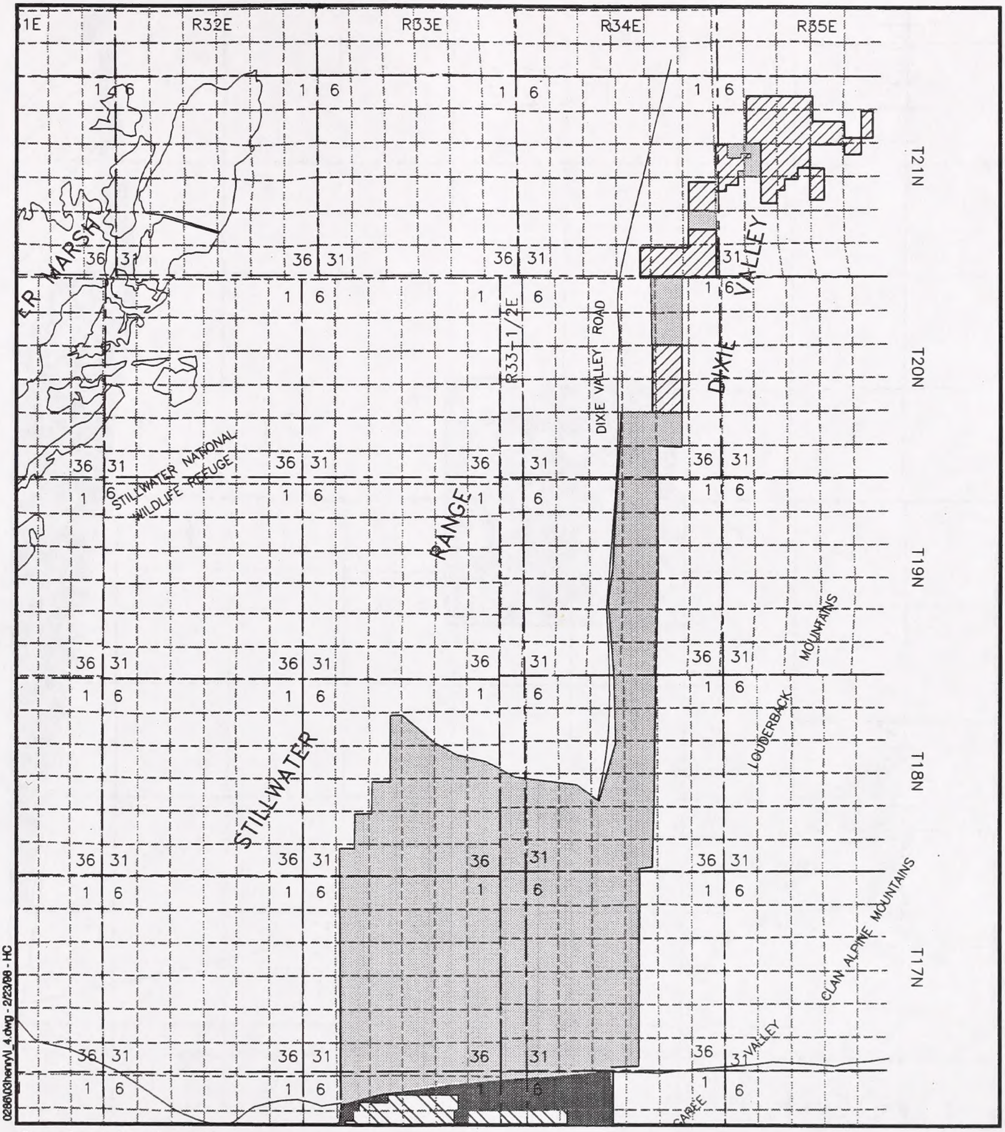
Approximate 1" = 1 mi.

Source: US Navy, 1996

B-19 Withdrawal Area

NAS Fallon, Nevada

Figure I-3



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The preferred alternative would withdraw approximately 68,600 acres. All lands would remain open to public access and managed as Category B land.

Dixie Valley Withdrawal Area

Legend:

■ Category A Land (Restricted Use)

░ Category B Land (Regulated Development)

- - -┼- - - Section Boundaries

N

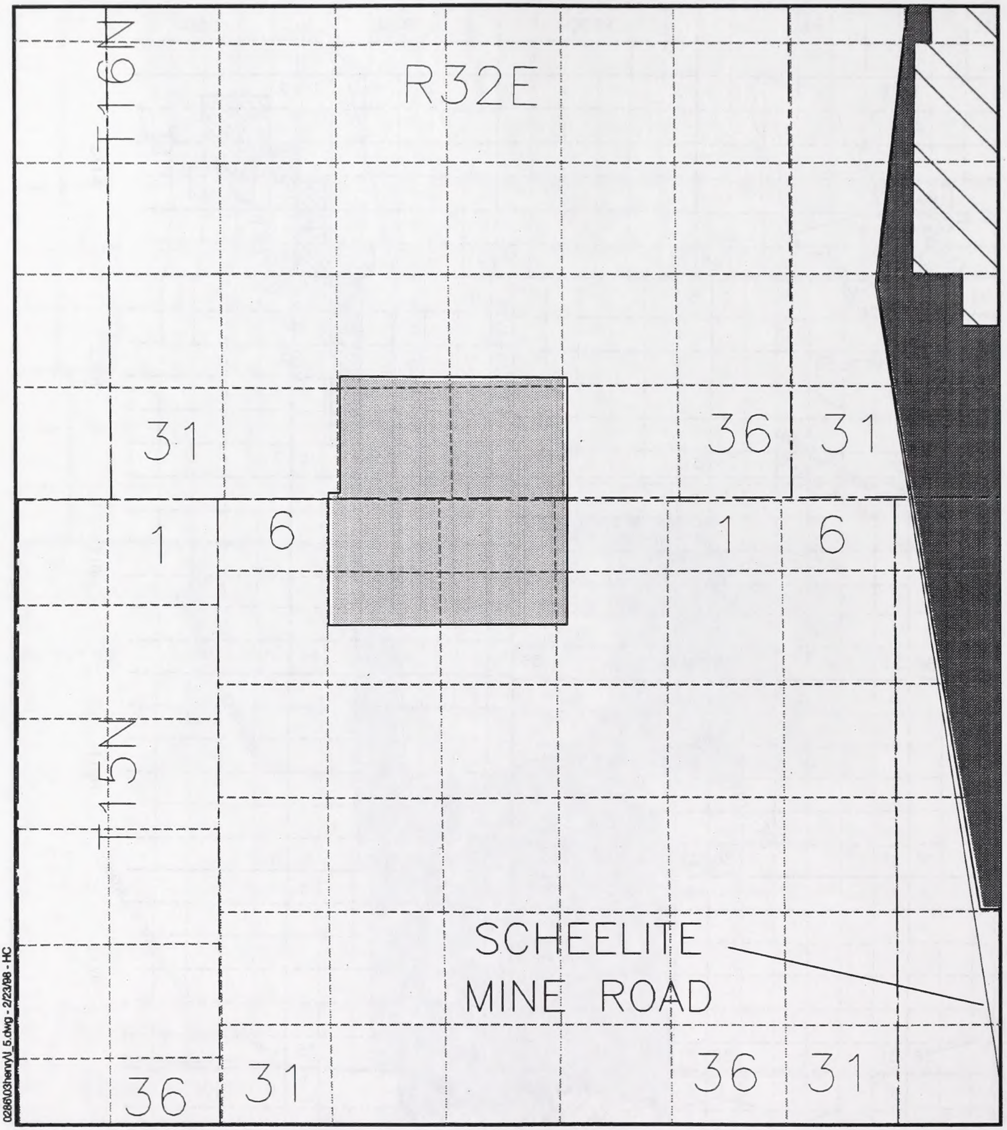
0 1.5 3

Approximate 1" = 1 mi.

Source: US Navy, 1996

NAS Fallon, Nevada

Figure I-4



The preferred alternative would withdraw approximately 2,765 acres. All land would remain open to public access and managed as Category B land.

Legend:

- ▩ Category A Land (Restricted Use)
- ▨ Category B Land (Regulated Development)
- - - ┼ - - Section Boundaries

N

0 0.5 1

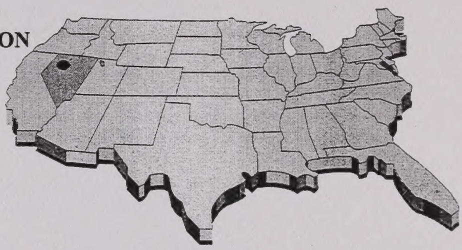
Approximate 1" = 1 mi.

Source: US Navy, 1996

Shoal Withdrawal Area

NAS Fallon, Nevada

Figure I-5



APPENDIX J

RESOURCE MANAGEMENT PLAN

APPENDIX J RESOURCE MANAGEMENT PLAN

Appendix J includes the plan, described in Section 2.3.2 of the EIS and analyzed in Chapter 4 of the EIS, that will govern the management of the areas proposed for withdrawal.

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RESOURCE MANAGEMENT PLAN

March 31, 1998

Prepared for

Engineering Field Activity West
Naval Facilities Engineering Command
San Bruno, CA 94066

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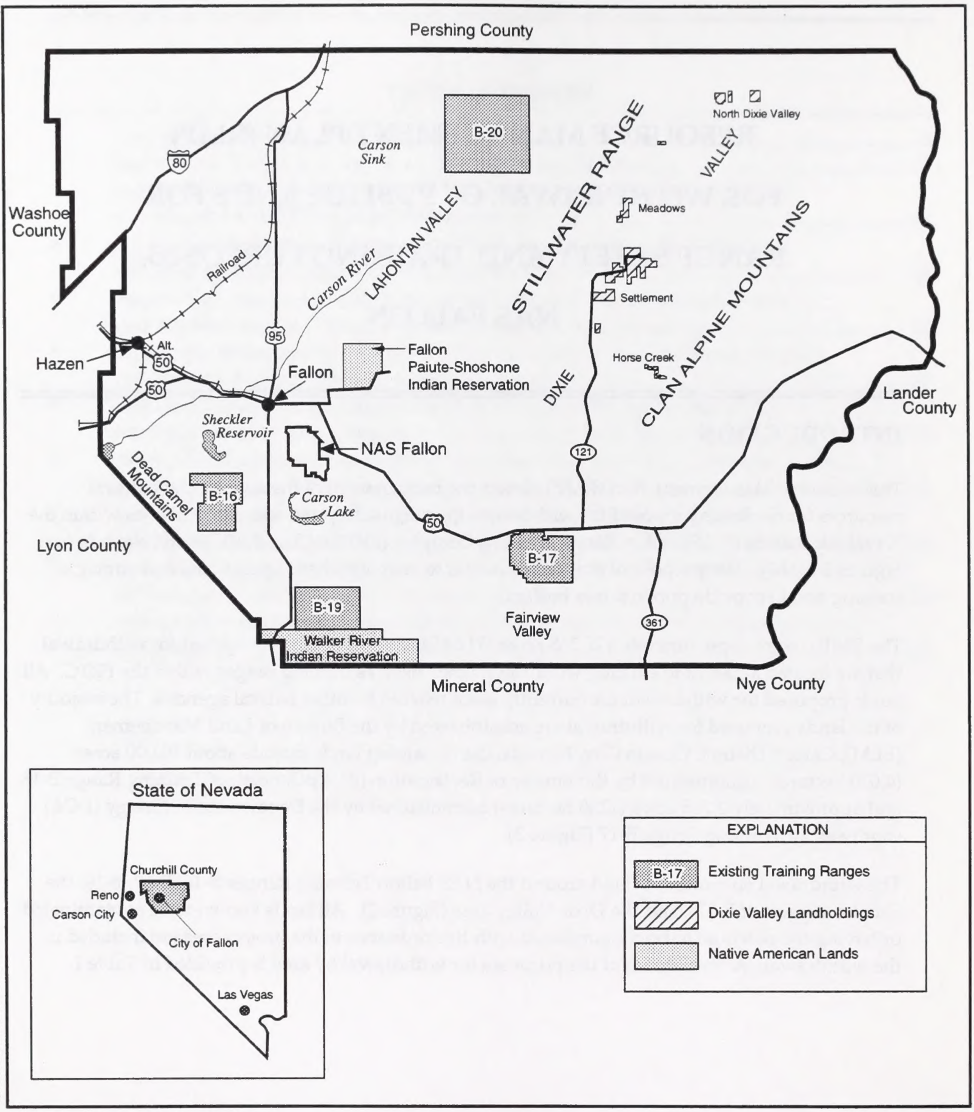
RESOURCE MANAGEMENT PLAN (RMP) FOR WITHDRAWAL OF PUBLIC LANDS FOR RANGE SAFETY AND TRAINING PURPOSES, NAS FALLON

INTRODUCTION

This Resource Management Plan (RMP) directs the management of the natural and cultural resources for the lands proposed for withdrawal for range safety and training purposes within the Naval Air Station (NAS) Fallon Range Training Complex (FRTC), Churchill County, Nevada (see Figures 1 and 2). The purpose of the withdrawal is to enable realistic operational and strategic training and to provide public safety buffers.

The RMP covers approximately 127,365 acres (51,545 hectares) of lands proposed for withdrawal that are located adjacent to existing withdrawn lands used as training ranges within the FRTC. All lands proposed for withdrawal are currently administered by other federal agencies. The majority of the lands proposed for withdrawal are administered by the Bureau of Land Management (BLM), Carson District, Carson City, Nevada; the remaining lands include about 10,000 acres (4,050 hectares) administered by the Bureau of Reclamation (BUREC) north of Training Range B-16 and approximately 2,765 acres (1200 hectares) administered by the Department of Energy (DOE) southwest of Training Range B-17 (Figure 3).

The withdrawal encompasses land around the NAS Fallon Training Ranges B-16, B-17, B-19, the Shoal site (west of B-17), and the Dixie Valley area (Figure 2). All lands known to be contaminated or having the potential to be contaminated with live ordnance in the project area are included in the withdrawal. A breakdown of the purposes for withdrawal by area is provided in Table 1.



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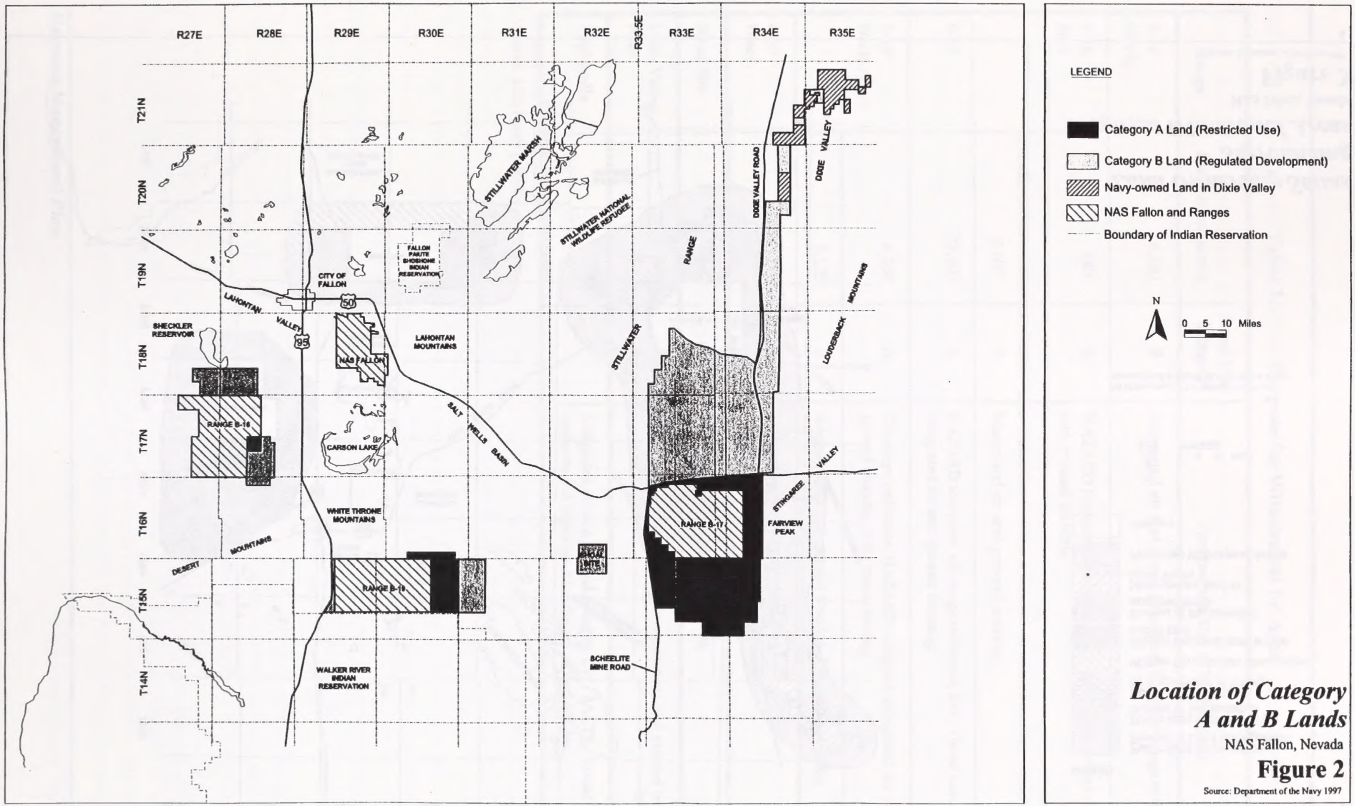
NAS Fallon is located in Churchill County, Nevada. In addition to the air station, the Navy administers four training ranges and owns lands in the Dixie Valley.

Location of NAS Fallon and the Training Ranges
NAS Fallon, Nevada
Figure 1

Source: Department of the Navy, 1997, and Tetratech, 1997

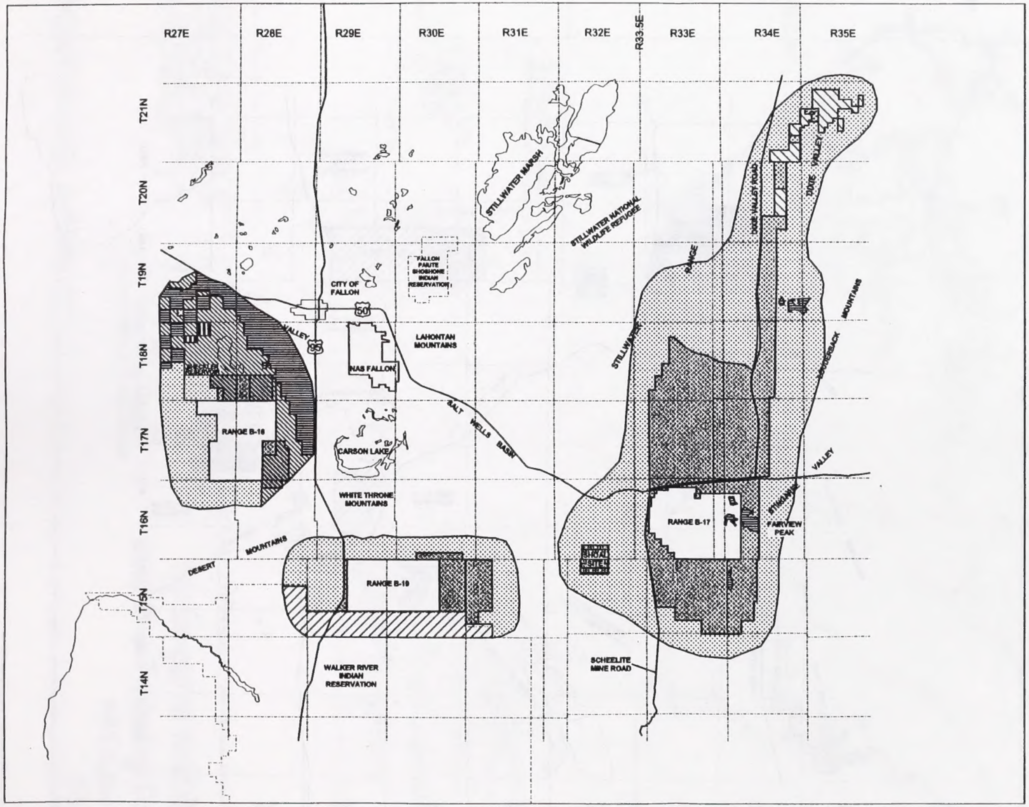


Location of Category A and B Lands

NAS Fallon, Nevada

Figure 2

Source: Department of the Navy 1997



LEGEND

░	Public land managed by Bureau of Land Management
▨	Public land withdrawn by Bureau of Reclamation
▦	Public land withdrawn by Department of Energy
▧	Walker River Indian Reservation
▤	Private land and non-federal public land
▥	Bureau of Reclamation acquired lands
▨	Navy-owned land in Dixie Valley
▒	Proposed Withdrawal Areas
☐	Ranges

N

0 5 10 Miles

All of the proposed withdrawal lands are administered by the BLM, BUREC, or DOE.

Land Ownership Status Surrounding Proposed Withdrawal Areas

NAS Fallon, Nevada

Figure 3

Source: Department of the Navy 1997

Table 1. Purpose for Withdrawal by Area

Range	Land Area (acres)	Land Use Category	Purpose and Use of Withdrawal
B-16 North	6,160	B	Integrated air and ground training, inert off-range ordnance
B-16 East	640	A	HAZARD footprint, inert off-range ordnance, integrated air and ground training
	3,600	B	Integrated air and ground training
B-17	33,400	A	HAZARD footprint, off-range ordnance, EW/visual cueing, integrated air and ground training
B-19 North/East	6,240	A	Off-range ordnance, HAZARD footprint, integrated air and ground training, EW/visual cueing
	5,120	B	Integrated air and ground training, EW/visual cueing
B-19 West	840	B	Integrated air and ground training
Shoal Site	2,765	B	Integrated air and ground training
Dixie Valley Area	62,500	B	EW/TACTS/visual cueing, integrated air and ground training
Panhandle	6,100		Integrated air and ground training, EW/TACTS/ visual cueing, connected to Navy land holdings in Dixie Valley

Source: U.S. Navy (1997).

The withdrawn lands would be placed in one of two land use categories:

- Category A, Exclusive Navy Use — Potential Ordnance Hazard; or
- Category B, Navy and Public Use — Limited Land Use Conflicts

This distribution is based on the same operational conditions and needs and safety considerations that led to the withdrawal proposal. For each proposed land use category, public access and reasonably foreseeable land management procedures are described. The land use categories, along with the access characteristics, land use implications, and management procedures for each, are discussed below.

Category A includes approximately 40,280 acres (16,300 hectares) of land east of B-16; north, south, and east of B-17; and north and east of B-19. Category A lands will be managed by the Navy and closed to public uses. Exceptions can be granted under special circumstances by the Commanding Officer, NAS Fallon. Management of Category A lands would be conducted by the Navy in accordance with existing laws, policy, and practices. The actual target impact areas at the ranges will not change or expand to include these lands. The purpose of Category A lands is to enhance public safety by segregating lands where ordnance has been found through off-range sweeps and by identifying potential ordnance impact areas associated with air-to-ground training.

Public Access/Recreation. Public access to Category A lands would not be permitted. All public access would be denied for safety reasons by fencing existing access roads and by posting signs. No recreational uses, organized or otherwise, would be permitted. Public access currently is closed on 24,464 acres (9,820 hectares) of land containing off-range ordnance under a BLM emergency closure action. Category B lands would remain open to use as described below.

Future Development/Structures. Category A lands would be closed to future development. Any Navy-proposed development would be subject to all environmental laws and regulations, including NEPA and guidelines of NAS Fallon's Cultural Resource Management Plan (CRMP) and Programmatic Agreement (PA) with the State Historic Preservation Officer (SHPO) and Advisory Council on Historical Preservation (ACHP). Any non-Navy proposals (agency or public), such as wildlife guzzlers, would continue to be subject to all environmental laws and regulations, in addition to approval by the Navy.

Livestock Grazing. No grazing would be permitted on Category A lands. Existing permits would be revoked by BLM after the land was withdrawn.

Mining. Category A lands would be closed to all mining and mineral exploration including locatable, leasable, and salable minerals. Mining new or existing claims would not be allowed. No leasing or development salable minerals would be permitted on Category A lands.

Cultural Resources/Natural Resources. No field investigations for cultural or natural resources would be allowed on Category A lands unless an ordnance sweep could be completed prior to field work. NAS Fallon maintains a CRMP and a PA with the Advisory Council on Historic Preservation (ACHP) and the Nevada SHPO that describes compliance requirements for the

Navy's management of cultural resources, including Section 106 of the National Historic Preservation Act (NHPA). Navy actions will undergo the appropriate NHPA Section 106 review and consultation for cultural resources. Endangered Species Act (ESA) review and Section 7 consultation will be conducted if a Navy action may affect threatened or endangered species.

Category B, approximately 87,000 acres (35,210 hectares), includes all remaining lands proposed for withdrawal (Figure 2). BLM would manage Category B lands in conjunction with the Navy, BUREC, and DOE, as applicable. Category B lands generally will remain open to public use. Category B lands would allow the Navy to meet the major training requirements, including integrated air and ground training, and siting of EW, TACTS, and visual cueing device sites.

BLM would continue to maintain jurisdiction over recreation, grazing, mining, and mineral, gas, and oil leases and utility corridors. This is consistent with public comments expressed at hearings on the DEIS for Withdrawal of Public Lands for Range Safety and Training Purposes, Naval Air Station (NAS) Fallon, Nevada, at which a strong interest in BLM management of the withdrawn lands was expressed. To ensure public safety and meet training requirements, the Navy would retain the right to review and approve activities, such as site development and organized recreation actions.

Although Category B lands would retain present access characteristics for public use, some controls, such as height restrictions, to new development would be applied. The Navy would conduct integrated air and ground training activities, such as combat search and rescue operations and close air support events, on some Category B lands. EW, TACTS, and portable visual cueing devices also would continue to be placed within these lands, mostly in the Dixie Valley, Fairview Valley, and east of B-19. Some land uses would be restricted on a limited basis if they affect operations or safety.

Current management practices for resources, including recreation, grazing, and mining, would continue on Category B lands. For activities currently requiring permits, such as site development and organized recreational events, the Navy would review and have the authority to approve actions to ensure conformance with public safety or Navy training activities. Management practices for each resource area are detailed below.

Public Access and Recreation. Public access for recreational uses of Category B lands would be consistent with current BLM regulations and land use plan decisions, including off-road vehicle (ORV) use designations. Any organized activities currently subject to BLM, BUREC, or DOE permitting procedures, such as off-road vehicle races, would require Navy approval.

Proposed Navy EW and TACTS sites would not be fenced if they are in remote locations but would be fenced to exclude the public in more accessible areas. EW, TACTS, and visual cueing device sites would not be chosen if they contain existing mining claims or ROWs. Organized recreational activities, such as off-road vehicle races, would not be permitted on developed sites. Abandoned sites would become available for organized recreational activity, in accordance with the surrounding land management categories.

Future Development/Structures. Category B lands are included in the proposed withdrawal primarily as a means for the Navy to provide training scenarios and to ensure operational safety. New developments would be subject to the requirements of the resource management plan. The Navy would obtain the right to approve new or modified developments. New structures or modifications to existing structures generally would be subject to a height limitation of 50 feet, though individual proposals such as those related to existing rights-of-way and utility corridors would be reviewed on a case-by-case basis. The Navy will waive height limits in cases where exceeding 50 feet is necessary for a short-term development, such as for an oil well, and where such a waiver does not pose a safety hazard to aircrews. Permanent nonconforming structures also might be allowed in some areas if, in the judgment of the Navy, such structures were compatible with Navy training uses.

Livestock Grazing. Livestock grazing on Category B lands would continue to be managed under current applicable laws, including the Taylor Grazing Act of 1934, the FLPMA of 1976, and the Public Rangelands Improvement Act of 1978. Grazing would continue, and existing grazing permits would be unchanged by withdrawal enactment. There would be no access restrictions to existing cow camps and range improvements. BLM would continue to have jurisdiction over grazing permits.

Livestock grazing on EW, TACTS, and visual cueing device sites would continue to be managed in accordance with current applicable laws. Grazing could continue on unfenced developed sites, but cattle would be excluded from fenced sites. Cow camps or other range improvements would be avoided when establishing developed sites, and these sites would be placed away from livestock water sources. Since most developed sites would be small, generally less than one acre, restricting on-site grazing is not expected to affect forage availability or the value of grazing allotments.

Mining. Mining would be permitted on most Category B lands under existing mining laws (Mining Act of 1872, Mineral Lands Leasing Act of 1920, as amended, Mineral Lands Act for Acquired Lands of 1947, and Geothermal Steam Act of 1970). These lands would be open for mineral exploration, for working existing patented and unpatented claims, and for staking new claims. The sought public law for the withdrawal would disallow new patenting of mining claims. Operations on claims (including leasable and salable materials) on Category B lands would continue to be managed through the standard issue of permits, leases, plans of operations, licenses, contracts, and grants.

Existing valid mining claims and areas of known mineralization would be avoided in the development of Navy sites. No mineral leases or sales would be authorized during site development or use by the Navy. No exploration or operations would be permitted within fenced EW and TACTS sites during their development or use. Unfenced sites could be explored, but mining operations could not take place. Abandoned sites would revert to Category B status and would be subject to Category B land use policies. Existing access and utility corridors for EW and TACTS sites would be available for mining exploration, subject to BLM regulations and Category B land use policies.

Cultural Resources/Natural Resources. Cultural resources would be managed according to the NAS Fallon CRMP and the PA with the Advisory Council and SHPO for Navy actions. The BLM would be responsible for cultural resource protection for non-Navy actions. Cultural and natural resources would continue to be afforded protection under applicable legislation and regulations. As with Category A lands, the Navy will identify the lands potentially containing cultural resources using the Carson Desert predictive model.

Natural resources, including soils, flora, and fauna, on EW, TACTS, and visual cueing device sites would be subject to identification, analysis, and impact mitigation, as required by various federal environmental laws and regulations. Site investigations and, where appropriate, mitigation plans will be completed prior to development. These areas would be available for field investigations until developed Navy sites are fenced.

Wilderness. The Navy has no plans for Category B lands that would impair the wilderness characteristics of lands in the Job Peak Wilderness Study Area (WSA), which lies adjacent to Category B lands in Dixie Valley. Public access to the Job Peak WSA would not be restricted by the Navy. The Navy has no plans for EW, TACTS, or visual cueing device site development in the WSA.

Water Access and Developments. The Navy would be notified and given the opportunity to review and approve new water developments on Category B lands, such as for cattle range improvements.

Establishing EW, TACTS, and visual cueing device sites would not affect existing or future water developments or water rights. Existing water developments would be avoided in site selection. Site selection also would avoid areas that could restrict access to water or in any other way affect water rights. No water development would be permitted on an EW or TACTS site during the term of its use.

Leases, Easements, Utility Corridors, and Rights-of-Way. The BLM would be responsible for issuing leases, easements and ROWs, or any other authorization with respect to the nonmilitary use of Category B lands. Navy opportunity to review and approve proposals is required to assess land use compatibility. The BLM would continue to manage existing leases, easements, ROWs, and utility corridors.

In summary, the Navy would manage Category A lands, and public access to these lands would be closed. Category B lands would be managed by the BLM, coordinated with the Navy, BUREC, and DOE where appropriate. Table 2 provides a summary of access characteristics, land use implications, and management procedures for each category.

Pursuant to federal regulations regarding the management of withdrawn land, this RMP has been developed by the Navy, in cooperation with the BLM, BUREC, and DOE, to provide land use policies for the withdrawn lands. (note: this draft is intended for distribution to BLM, BUREC, and DOE to begin the referenced coordination process). Resource information obtained from agency files, staff, and existing documents was utilized to develop this RMP.

This plan is prepared in tandem with Environmental Impact Statement for Withdrawal of Public Lands for Range Safety and Training Purposes, Naval Air Station Fallon, Nevada (Department of the Navy 1997), which has been prepared to meet the requirements of the National Environmental Policy Act (NEPA) of 1969.

Table 2. Summary of Land Use Controls on Category A and B lands

	Category A - Exclusive Navy Use: Potential Ordnance Hazard	Category B - Navy and Public Use: Limited Land Use Conflicts
General Land Management Description	Closes land to public use because of safety concerns. Includes land identified as containing, or potentially containing, off-range ordnance.	Least restrictive land use. Would maintain multiple land uses with few regulations. Most lands fall into this category and would be managed by the BLM with Navy review and approval..
Public Access; Recreational Use	Closed to access to protect public safety.	Public access, recreational use not controlled. Organized events are subject to existing laws and must receive Navy approval. EW sites would be closed to the public, except for remote sites.
Future Development/ Structures	None allowed; exceptions require CO NASF review and approval.	Navy: NEPA compliance. Non-Navy: NEPA and BLM regulations and Navy review; 50' height limit on new or modified structures.
Mining *Exploration*	No new exploration permitted.	Regulated under existing laws with Navy review and approval of mining developments. Developed Navy sites closed to exploration during period of use. Open to public once site is abandoned.
Mining *Existing Claims*	No mining activity would be permitted because of safety hazards to miners from ordnance.	Claims access and operations regulated by BLM with review and approval of mining developments. Developed Navy sites would avoid existing claims.
Mining *New Claims*	No new claims permitted.	Regulated under existing mining laws with Navy review and approval of mining developments. The proposed withdrawal would preclude patenting of unpatented claims.
Leasable/Salable Minerals	No new leases, sales, developments.	BLM issues leases, permits, licenses, contracts, and grants with Navy review and approval. No new leases would be permitted once Navy site was proposed or in use. Leases allowed once site is abandoned.
Grazing	No grazing would be allowed on Category A lands because of existing and potential off-range ordnance hazards.	The BLM will continue to administer permits and to regulate activities under existing laws with Navy review and approval of range improvements. Use and maintenance of existing range improvements and cow camps permitted. Grazing permitted on unfenced developed Navy sites but excluded from fenced sites.
Cultural/Natural Resources *	Field investigations generally not allowed unless preceded by ordnance sweep; CRMP and PA describe compliance requirements (such as Section 106) for cultural resources.	Navy responsible for Section 106 and Section 7, as applicable for Navy actions; BLM responsible for Section 106 and Section 7, as applicable for non-Navy actions.

Table 2. Summary of Land Use Controls on Category A and B lands

	Category A - Exclusive Navy Use: Potential Ordnance Hazard	Category B - Navy and Public Use: Limited Land Use Conflicts
Wilderness	No Wilderness Areas or Wilderness Study Areas are designated as Category A lands.	Navy has no plans that would affect wilderness designation of Job Peak WSA. Navy will delete Job Peak WSA from withdrawal request if it is designated a wilderness area. Developed Navy sites would avoid WSA.
Water Access and Developments	New water developments and access to existing water developments would not be allowed on Category A lands to anyone other than BLM.	Navy to review and approve new water development proposals. New development restricted on developed Navy sites during period of use.
Leases, Easements, Rights-of-way	Generally no new leases, easements, or ROWs allowed. Existing leases, easements, or ROWs administratively managed by current jurisdictional agency.	BLM issues with Navy review and approval required to avoid incompatible land uses.

Note: * including threatened/endangered species and wetlands

Source: U.S. Navy (1997).

RESOURCE PLAN

Resource discussions in this RMP provide a listing of Management Objectives, Management Direction, and Management Actions that are a result of this planning effort. These discussions include the valid management actions that were taking place prior to this RMP. All of these management actions will be implemented and used for the cooperative management of the natural and cultural resources by BLM, NAS Fallon, BUREC, DOE, and other Federal, State, and local agencies on Category B lands. Where appropriate, the following resource discussions are accompanied by a map showing the location of that resource within the planning area. Permits associated with certain of these resources are listed below; BLM will assume review and approval authorities for these permits, subject to Navy concurrence.

Resources and management issues addressed in this RMP include the following:

- Vegetation including Threatened or Endangered Plant Species
- Wildlife including Threatened and Endangered Wildlife Species
- Soil, Water, and Air Resources
    - Shoal Site Monitoring
- Lands Program (rights-of-way/utility corridors; land use authorizations)
    - Right-of-Way (ROW) permits
- Fire Management
- Minerals/Mining/Geothermal
    - Mining Claims
- Livestock Grazing and Wild Horses
    - Development of Facilities
- Recreation, Wilderness, Hunting & Trapping (Access Issues)
    - Group Recreational Permits
- Visual Resources
- Cultural Resources

The area covered by this RMP will be referred to as the "planning area" in the following resource discussions, which address vegetation and wildlife habitat in this preliminary internal review draft. Except as noted, the following management objectives, direction, and actions apply to all Category B lands.

VEGETATION INCLUDING THREATENED AND ENDANGERED PLANT SPECIES

The following objectives are general and reflect a current lack of site-specific resource inventory data for the lands proposed for withdrawal. Upon completion of resource inventories and baseline descriptions for these lands, more site specific objectives will be developed as necessary by NAS Fallon in cooperation with BLM, BUREC, and DOE as components of action or activity plans.

MANAGEMENT OBJECTIVES

V-O-1 To establish or maintain a prescribed ecological status, Desired Plant Communities, plant species composition, and species diversity.

V-O-2 To maintain a static to upward apparent trend in ecological status or towards Desired Plant Communities.

V-O-3 To conserve sensitive plant species and their habitat. Sensitive plant species include listed and proposed threatened or endangered species, candidates for federal listing as threatened or endangered, and federal Species of Concern (formerly Category 2 candidates for listing as threatened or endangered).

V-O-4 To minimize the establishment or spread of invasive exotic plant species, including noxious weeds.

MANAGEMENT DIRECTION

V-D-1 Use species native to the area for revegetation efforts when and where feasible.

V-D-2 Restrict surface disturbing activities in habitat of sensitive plant species, including threatened or endangered species.

V-D-3 Monitor areas adjacent to existing wild horse herd management areas to identify incursion of wild horses into the planning area.

V-D-4 Develop and maintain water sources on grazing allotments to achieve proper distribution of livestock and utilization of forage by livestock, horses, and other wildlife.

V-D-5 Use fencing only when monitoring demonstrates that other management practices are not successful in achieving the identified objectives.

V-D-6 Protect or enhance sensitive habitat areas, including wetlands.

V-D-7 Review and approve development proposals for potential impact to training safety.

MANAGEMENT ACTIONS

V-A-1 Develop and implement activity plans for wetland habitat areas throughout the planning area.

V-A-2 Build and maintain boundary fence between designated grazing allotments and Category A lands as necessary to prevent livestock from moving into Category A lands.

V-A-3 If monitoring detects potentially damaging incursion of wild horses into planning areas, take management action to exclude the horses or minimize their damage.

V-A-4 Prevent spread of established noxious weeds such as Russian knapweed and attempt to control or eliminate other noxious weeds species identified during monitoring.

The applicability of each management objective, direction, and action to the specific areas included in the withdrawn lands is summarized in Table 3.

Table 3. Applicable Management Objectives, Directions, and Actions for Vegetation on Category A and B Lands by Withdrawal Area

	PROPOSED WITHDRAWAL AREA									
	B-16 N	*B-16 E*	*B-17 N*	*B-17 S*	*B-17 E*	*B-17 W*	*B-19 E*	*B-19 W*	*Dixie Valley*	*Shoal Site*
Management Objectives										
V-O-1	B	A/B	A	A	A	A	A/B	B	B	B
V-O-2	B	A/B	A	A	A	A	A/B	B	B	B
V-O-3 [3]	B	A/B	A	A	A	A	A/B	B	B	B
V-O-4	B	A/B	A	A	A	A	A/B	B	B	B
Management Direction										
V-D-1	B	A/B	A	A	A	A	A/B	B	B	B
V-D-2	B	A/B	A	A	A	A	A/B	B	B	B
V-D-3		A/B							B	
V-D-4	B[1]	B					B	B	B	B
V-D-5	B	B					B	B	B	B
V-D-6 [2]	B	A/B	A	A	A	A	A/B	B	B	B
V-D-7	B	B					B	B	B	B
Management Actions										
V-A-1	B		A						B	
V-A-2		A	A							
V-A-3	A	A/B	A	A	A	A	A/B	B	B	B
V-A-4	A	A/B	A	A	A	A	A/B	B	B	B

Notes: 1. Grazing on this land currently administered by BUREC and thus it does not have identified BLM grazing allotments.
2. Applies to any site where sensitive habitat areas, including wetlands, have been identified.
3. There are no federally listed threatened or endangered plant species currently identified within the withdrawal areas.

WILDLIFE INCLUDING THREATENED AND ENDANGERED WILDLIFE SPECIES

MANAGEMENT OBJECTIVES

W-O-1	To manage wildlife habitat within Category A lands for maximum sustainable wildlife value.
W-O-2	To manage wildlife habitat within designated grazing allotments to sustain viable wildlife populations (Category B lands).
W-O-3	To protect threatened and endangered wildlife and their habitat.

MANAGEMENT DIRECTION

W-D-1	Exclude livestock and wild horses from Category A lands.
W-D-2	Monitor/review development and mining permits to reduce impacts to wildlife.
W-D-3	Continue to recognize reserved forage for pronghorn antelope, mule deer, and desert bighorn sheep in designated grazing allotments at current levels; reallocate forage reserved for wildlife and livestock appropriate to the productivity of the remaining portions of allotments reduced in size due to Category A withdrawal.
W-D-4	Provide permanent water sources for wildlife on designated grazing allotments as funds are available.
W-D-5	Conduct monitoring of wildlife as a cooperative effort between NAS Fallon, BLM, and the Nevada Division of Wildlife.

MANAGEMENT ACTIONS

W-A-1	Develop and maintain up to 40 water sources for wildlife throughout the withdrawal area as funds are available.
W-A-2	Minimize impacts on wildlife and wildlife habitat and protect threatened and endangered species and their habitat by requiring appropriate impact avoidance or mitigation measures for mining and development project applications.
W-A-3	Nuisance animal control will be authorized, as required, through the District Animal Damage Control Plan (ADC), in coordination with BLM, NAS Fallon, the Nevada Division of Wildlife, and the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture.

The applicability of each management objective, direction, and action to the specific areas included in the withdrawn lands is summarized in Table 4.

Table 4. Applicable Management Objectives, Directions, and Actions for Wildlife on Category A and B Lands by Withdrawal Area

	PROPOSED WITHDRAWAL AREA									
	B-16 N	*B-16 E*	*B-17 N*	*B-17 S*	*B-17 E*	*B-17 W*	*B-19 E*	*B-19 W*	*Dixie Valley*	*Shoal Site*
Management Objectives										
W-O-1		A[1]	A[1]	A[1]	A[1]	A[1]	A[1]			
W-O-2	B[2]	B					B	B	B	B[3]
W-O-3	B	A/B	A	A	A	A	A/B	B	B	B
Management Direction										
W-D-1		A	A	A	A	A	A			
W-D-2	B	B					B	B	B	B
W-D-3	B[2]	B					B	B	B	B
W-D-4	B	A/B	A	A	A	A	A/B	B	B	B
W-D-5	B	A[4]/B	A[4]	A[4]	A[4]	A[4]	A[4]/B	B	B	B
Management Actions										
W-A-1	B	A/B	A	A		A	A/B	B	B	B
W-A-2	B	B					B	B	B	B
W-A-3	B	A/B	A	A	A	A	A/B	B	B	B

Notes:

1. Assumes that BLM licensed livestock grazing will be excluded from Category A lands by fencing and that Category A lands would be managed for maximum wildlife value (consistent with mission).
2. Assumes that B-16 north land within the BUREC jurisdiction is currently authorized for livestock grazing and would have grazing allotments extended into it after withdrawal.
3. Assumes that the Shoal Site is within the Le Beau Flat Grazing Allotment (based on DEIS Figure 3-10).
4. Monitoring of wildlife populations would be conducted in Category A lands solely under supervision of NAS Fallon personnel.

SOILS, WATER, AND AIR RESOURCES

The following management objectives, directions, and actions focus on the related issues of protection of soil and preventing deterioration of water and air quality on Category A and B lands.

MANAGEMENT OBJECTIVES

S-O-1 To protect the soil resource by minimizing erosion.

S-O-2 To maintain or enhance water quality and availability.

S-O-3 To prevent deterioration of air quality.

MANAGEMENT DIRECTION

S-D-1 Minimize disturbances to natural vegetation and soils on Category A and B lands.

S-D-2 Manage Category A and B lands to protect, enhance, and prevent deterioration of soil, water and air resources.

MANAGEMENT ACTIONS

S-A-1 Revegetate disturbed areas when and where feasible; minimize removal of vegetation.

S-A-2 Review proposed projects or permitted activities to ensure disturbance to natural vegetation and soils are minimized.

S-A-3 Identify Best Management Practices (BMPs) for implementation to minimize soil erosion, siltation, or dust generation from proposed civilian or military activities.

S-A-4 Review all proposed Navy and civilian projects on Category B lands to ensure unrestricted access to existing water developments and that existing water rights are unaffected.

S-A-5 Develop and maintain water sources on grazing allotments to achieve proper distribution of livestock and utilization of forage by livestock, horses, and other wildlife.

Shoal Site Monitoring. Special considerations are necessary for the Shoal Site. The Project Shoal Site located in the Sand Spring Range west of Range B-17 has been managed by the U.S. Department of Energy, as successor agency to the U. S. Atomic Energy Commission. It was withdrawn in 1962 for testing to determine whether seismic waves from underground nuclear testing could be differentiated from natural earthquakes. One nuclear device was exploded 367 m (1,205 ft) below the surface on this site in 1963. As a result of this test, the site is subject to controls on entry to the subsurface area within a defined exclusion zone between the depths of 55 m (180 ft) and 518 m (1,700 ft) below surface ground zero and extending laterally 1,006 m (3,300 ft). Access to the surface of the site is currently uncontrolled. Long-term access to the site for continued subsurface monitoring and remediation activities by DOE would be required. It is anticipated that monitoring of groundwater flow and contamination and institutional control of subsurface access will continue on this site for at least 50 years into the future. It is anticipated that the Navy and DOE would participate in a joint withdrawal of the Project Shoal Site. Institutional control of the Project Shoal Site for purposes of preventing access to the subsurface radioactive contamination will remain with the DOE.

Table 5. Applicable Management Objectives, Directions, and Actions for Soil, Water, and Air Resources on Category A and B Lands by Withdrawal Area

	PROPOSED WITHDRAWAL AREA									
	B-16 N	*B-16 E*	*B-17 N*	*B-17 S*	*B-17 E*	*B-17 W*	*B-19 E*	*B-19 W*	*Dixie Valley*	*Shoal Site*
Management Objectives										
S-O-1	B	A/B	A	A	A	A	A/B	B	B	B
S-O-2	B	A/B	A	A	A	A	A/B	B	B	B
S-O-3	B	A/B	A	A	A	A	A/B	B	B	B
Management Direction										
S-D-1	B	A/B	A	A	A	A	A/B	B	B	B
S-D-2	B	A/B	A	A	A	A	A/B	B	B	B
Management Actions										
S-A-1	B	A/B	A	A	A	A	A/B	B	B	B
S-A-2	B	B					B	B	B	B
S-A-3	B	A/B	A	A	A	A	A/B	B	B	B
S-A-4	B	B					B	B	B	B
S-A-5	B	B					B	B	B	B

LANDS PROGRAM

Rights-of-way (ROW) within the land withdrawal area have been designated for roads, utility corridors, transmission lines, and pipelines. Both the existing and planned corridors are shown in Figure 4.

MANAGEMENT OBJECTIVES

L-O-1 To provide for public safety on Category A lands.

L-O-2 To retain current levels of public access to Category B lands to the extent that no conflicts with safe military operations occur.

MANAGEMENT DIRECTION

L-D-1 Nonmilitary uses will be excluded from Category A lands, which will be managed by the Navy. Exceptions may be made by the Navy in certain cases and will be dependent upon public safety factors and military use compatibility.

L-D-2 Category B lands will be managed by the BLM, BUREC, or DOE, as appropriate.

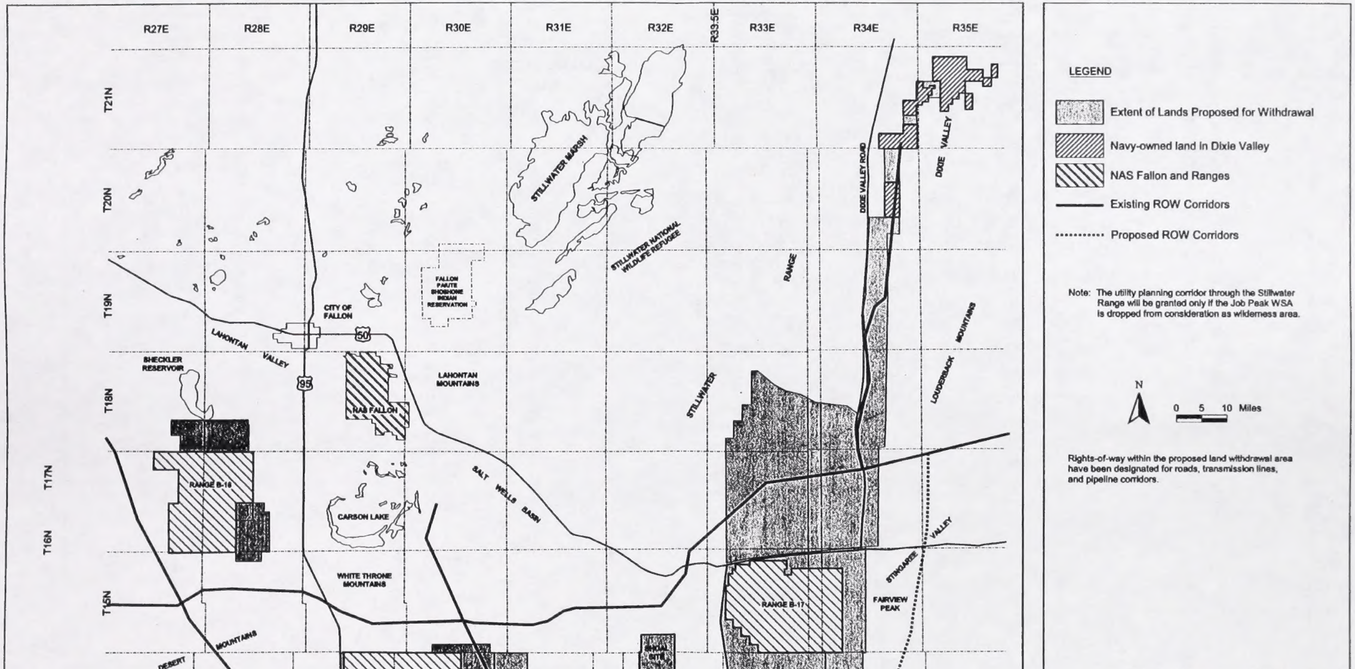
L-D-3 The BLM will maintain jurisdiction over ROW grants, mining, grazing, mineral, gas, and oil leases, along with ORV events on Category B lands.

MANAGEMENT ACTIONS

L-A-1 Public access will be prohibited on Category A lands, and no leases or ROW easements will be issued.

L-A-2 The BLM, BUREC, or DOE will continue to issue any leases, easements, ROWs, or other authorization with respect to the nonmilitary use of Category B lands, subject to Navy review and approval.

The applicability of each management objective, direction, and action to the specific areas included in the withdrawn lands is summarized in Table 6.



Note: The utility planning corridor through the Stillwater Range will be granted only if the Job Peak WSA is dropped from consideration as wilderness area.

Rights-of-way within the proposed land withdrawal area have been designated for roads, transmission lines, and pipeline corridors.

Existing and Planned Right-Of-Way Corridors

NAS Fallon, Nevada

Figure 4

Source: Department of the Navy 1997

Table 6. Applicable Management Objectives, Directions, and Actions for Lands Program on Category A and B Lands by Withdrawal Area

	PROPOSED WITHDRAWAL AREA									
	B-16 N	*B-16 E*	*B-17 N*	*B-17 S*	*B-17 E*	*B-17 W*	*B-19 E*	*B-19 W*	*Dixie Valley*	*Shoal Site*
Management Objectives										
L-O-1		A	A	A	A	A	A			
L-O-2	B	B					B	B	B	B
Management Direction										
L-D-1		A	A	A	A	A	A			
L-D-2	B	B					B	B	B	B
L-D-3	B	B					B	B	B	B
Management Actions										
L-A-1		A	A	A	A	A	A			
L-A-2	B	B					B	B	B	B

FIRE MANAGEMENT

Suppression of wildland fires in the project area is important to protect structures and range improvements, for human safety, and to avoid conversions of range lands to dominance by undesirable species such as cheatgrass. It is anticipated that wildland fire suppression activities in and around Category B lands would be conducted by the Navy and BLM under a cooperative agreement that would be developed between NAS Fallon and the BLM Carson City District. Fire suppression activities would be the sole responsibility of the Navy on Category A lands potentially contaminated by ordnance.

MINERALS/MINING/GEOTHERMAL

Figures 5 and 6 show areas of mining districts and known and potential mineral deposits, respectively.

MANAGEMENT OBJECTIVES

M-O-1 To allow mining, geothermal, and minerals exploration activities on Category B lands to the extent that they do not conflict with safe Navy operations.

MANAGEMENT DIRECTION

M-D-1 Category A lands will be closed to all mining and mineral exploration.

M-D-2 Mining will be permitted on most Category B lands under existing mining laws (Mining Act of 1872, Mineral Lands Act for Acquired Lands of 1947, and Geothermal Steam Act of 1970), with specific limitations on heights of structures to be imposed by the Navy.

MANAGEMENT ACTIONS

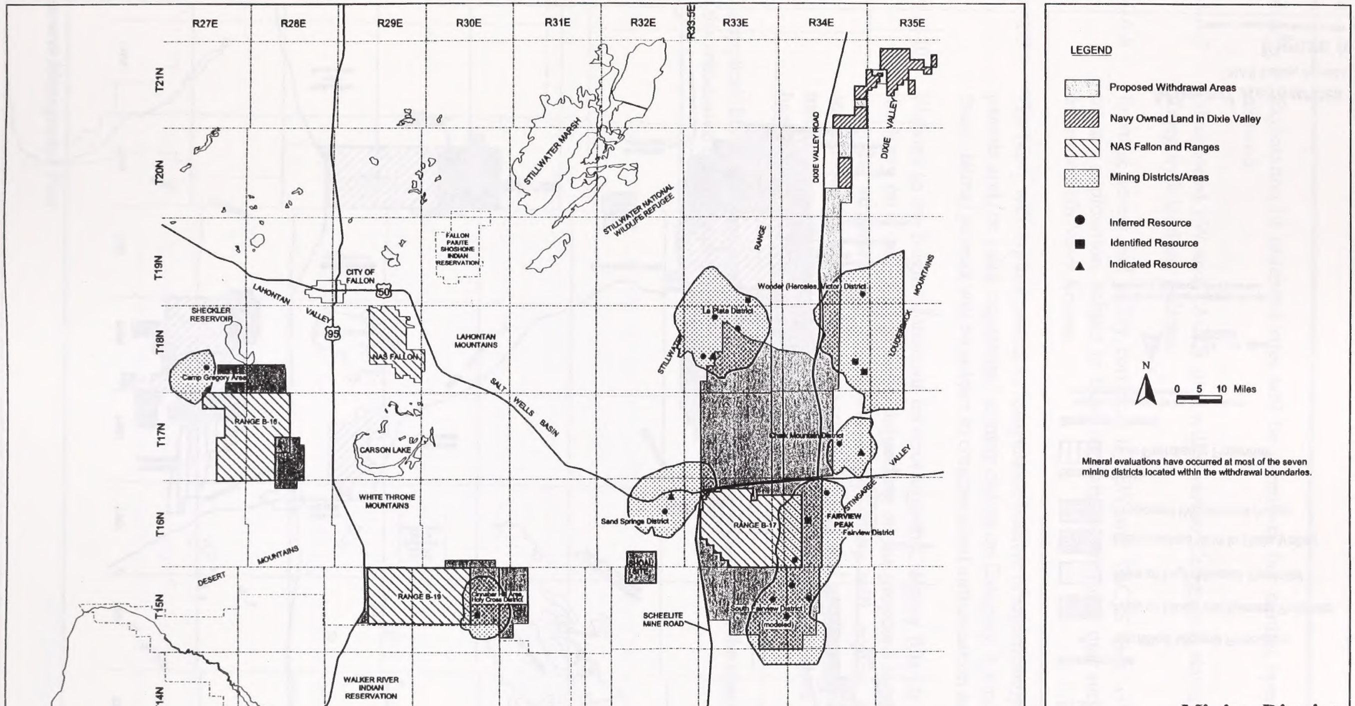
M-A-1 Category B lands will be open for mineral exploration, working existing patented and unpatented claims, and staking new claims, except within Navy developed sites.

M-A-2 Access to claims will be regulated by the BLM, as currently occurs.

M-A-3 Operations on claims (including leasable and salable materials) on Category B lands will be managed by the BLM through the issuance of permits, leases, plans of operation, licenses, and contracts and grants, subject to Navy concurrence.

M-A-4 Existing valid mining claims and areas of known mineralization will be avoided when developing Navy sites.

M-A-5 Exploration or operations within fenced EW and TACTS sites will not be permitted.



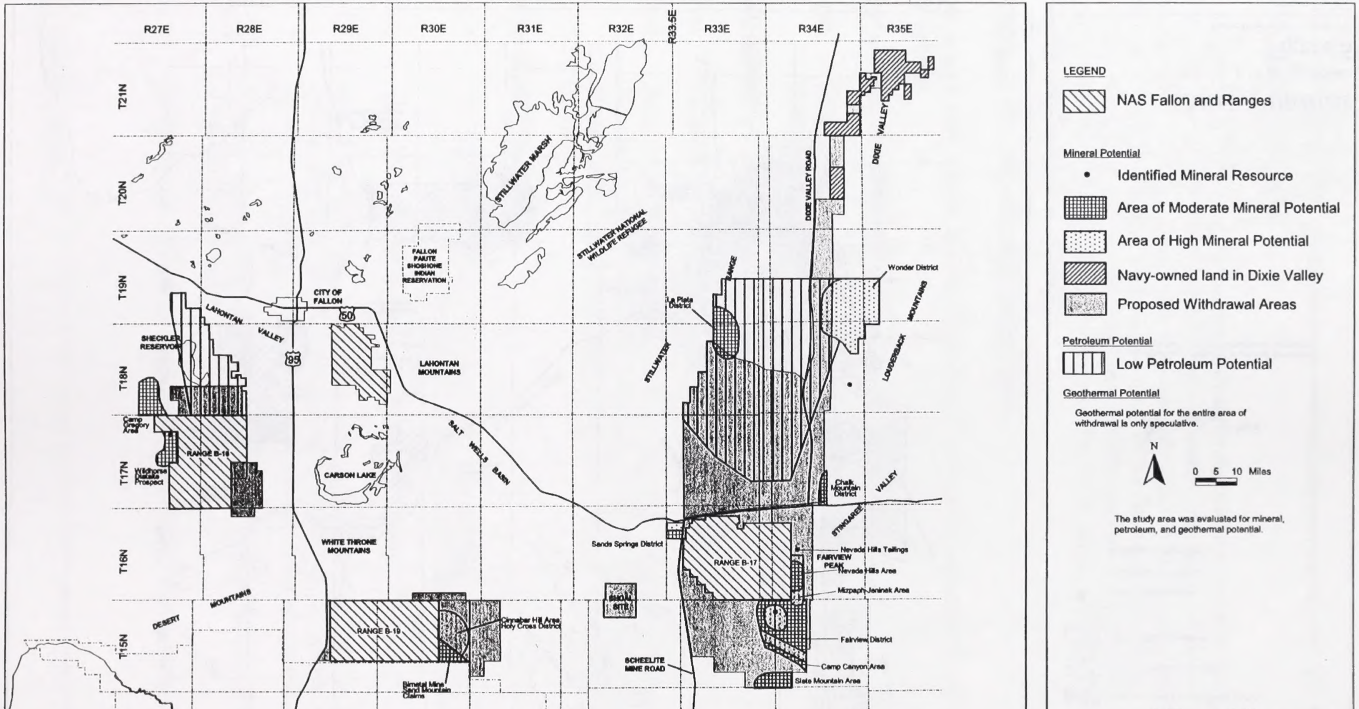
Mineral evaluations have occurred at most of the seven mining districts located within the withdrawal boundaries.

Mining Districts

NAS Fallon, Nevada

Figure 5

Source: Department of the Navy 1997



Geothermal potential for the entire area of withdrawal is only speculative.

The study area was evaluated for mineral, petroleum, and geothermal potential.

Mineral Resources

NAS Fallon, Nevada

Figure 6

Source: Department of the Navy 1997

M-A-6 Exploration of unfenced sites will be permitted, but mining operations will not be allowed.

M-A-7 Abandoned EW and TACTS sites will revert to Category B status and be subject to Category B land use policies.

M-A-8 Existing access and utility corridors for EW and TACTS sites will be available for mining exploration, subject to BLM regulations, provided that such activities do not interfere with Navy Access.

M-A-9 The Navy will explore means to compensate holders of significantly impacted mining patents and/or valid unpatented mining claims on Category A lands. Acquisition of these claims/patents will be subject to congressional authorization and appropriation.

M-A-10 Waivers to the height limitations on structures in Category B lands may be issued by the Navy on a case-by-case basis, depending on the proposed location and length of time the structure will be needed. The Navy will explore the possibility of accommodating equipment necessary for oil, gas, and geothermal drilling if it is to be installed for relatively short periods or in locations where it does not pose a safety hazard to military operations.

The applicability of each management objective, direction, and action to the specific areas included in the withdrawn lands is summarized in Table 7.

Table 7. Applicable Management Objectives, Directions, and Actions for Minerals/Mining/Geothermal on Category A and B Lands by Withdrawal Area

	PROPOSED WITHDRAWAL AREA									
	B-16 N	*B-16 E*	*B-17 N*	*B-17 S*	*B-17 E*	*B-17 W*	*B-19 E*	*B-19 W*	*Dixie Valley*	*Shoal Site*[1]
Management Objectives										
M-O-1	B	B					B	B	B	B
Management Direction										
M-D-1		A	A	A	A	A	A			
M-D-2	B	B					B	B	B	B
Management Actions										
M-A-1	B	B					B	B	B	B
M-A-2	B	B					B	B	B	B
M-A-3	B	B					B	B	B	B
M-A-4	B	B					B	B	B	B
M-A-5	B	B					B	B	B	B
M-A-6	B	B					B	B	B	B
M-A-7	B	B					B	B	B	B
M-A-8	B	B					B	B	B	B
M-A-9		A	A	A	A	A	A			
M-A-10	B	B					B	B	B	B

Note: 1. Surface access is currently unrestricted on the Shoal Site; however, there is a strictly enforced exclusion on underground entry due to radioactive contamination between 55 m (180 ft) and 518 m (1,700 ft) depth. DOE will regulate any underground access.

LIVESTOCK GRAZING AND WILD HORSES

The locations of existing grazing allotments and wild horse management areas are shown in Figures 7 and 8, respectively. Existing grazing allotments are present in the proposed withdrawal areas. Existing wild horse herd management areas (HMAs) are present in the vicinity of B-16 S and Dixie Valley. None of these HMAs overlaps proposed withdrawal areas treated in this Resource Management Plan, however the Clan Alpine HMA is adjacent to the panhandle portion of the Dixie Valley withdrawal area.

MANAGEMENT OBJECTIVES

L/H-O-1	To improve the condition and productivity of rangelands to enhance livestock grazing on Category B lands.
L/H-O-2	To allow maintenance and management of populations of wild, free-roaming horses within designated herd management areas (Figure 8) in accordance with the Wild, Free-Roaming Horses and Burro Act of 1971 and BLM's policy.
L/H-O-3	To discourage expansion of wild horse populations onto Category A or B lands and to maintain the withdrawal areas as a burro-free area.
L/H-O-4	To achieve a thriving ecological balance consistent with other resource values.

MANAGEMENT DIRECTION

L/H-D-1	Plan Navy surface activities to avoid or minimize interference with permitted livestock grazing on Category B lands.
L/H-D-2	Livestock grazing on Category B lands would continue under current applicable laws (the Taylor Grazing Act of 1934, the FLPMA of 1976, and the Public Rangelands Improvement Act of 1978) and BLM policy. No livestock grazing would be licensed under existing permits on Category A lands.
L/H-D-3	Conduct annual monitoring to determine rangeland condition on Category B lands and to determine if wild horse populations from the herd management areas or wild burros are encroaching on Category A or B lands.
L/H-D-4	Develop a gathering plan for the removal of wild horses or burros from Category A or B lands outside designated herd management areas.

MANAGEMENT ACTIONS

L/H-A-1	Current grazing permits on Category A lands would be revoked after the land is withdrawn. (Grazing would continue under existing grazing permits on Category B lands) . The renewal of grazing permits would continue to be handled by the BLM.

L/H-A-2 In Category B lands grazing would be excluded from fenced Navy sites (e.g., threat emitters) but could continue on unfenced developed sites. Cow camps, livestock water sources, or other range improvements would be avoided when establishing Navy sites whenever possible.

L/H-A-3 Ensure that Navy activities or permitted civilian activities or developments do not restrict access to existing cow camps and range improvements.

L/H-A-4 Reallocate forage reserved for wildlife and livestock on Category B lands, if necessary, appropriate to the productivity of the remaining portions of allotments reduced in size due to Category A withdrawal.

L/H-A-5 Make adjustments in livestock grazing management as necessary to maintain a static to upward apparent trend in ecological status or to attain Desired Plant Communities.

L/H-A-6 Conduct gatherings as necessary to remove wild horses outside the boundaries of designated herd management areas.

L/H-A-7 Remove all burros from Category A or B lands when encountered.

L/H-A-8 Amend, if necessary, the Herd Management Area Plans (HMAPS) for Horse Mountain, South Stillwater, and Clan Alpine HMAs to conform with this resource plan.

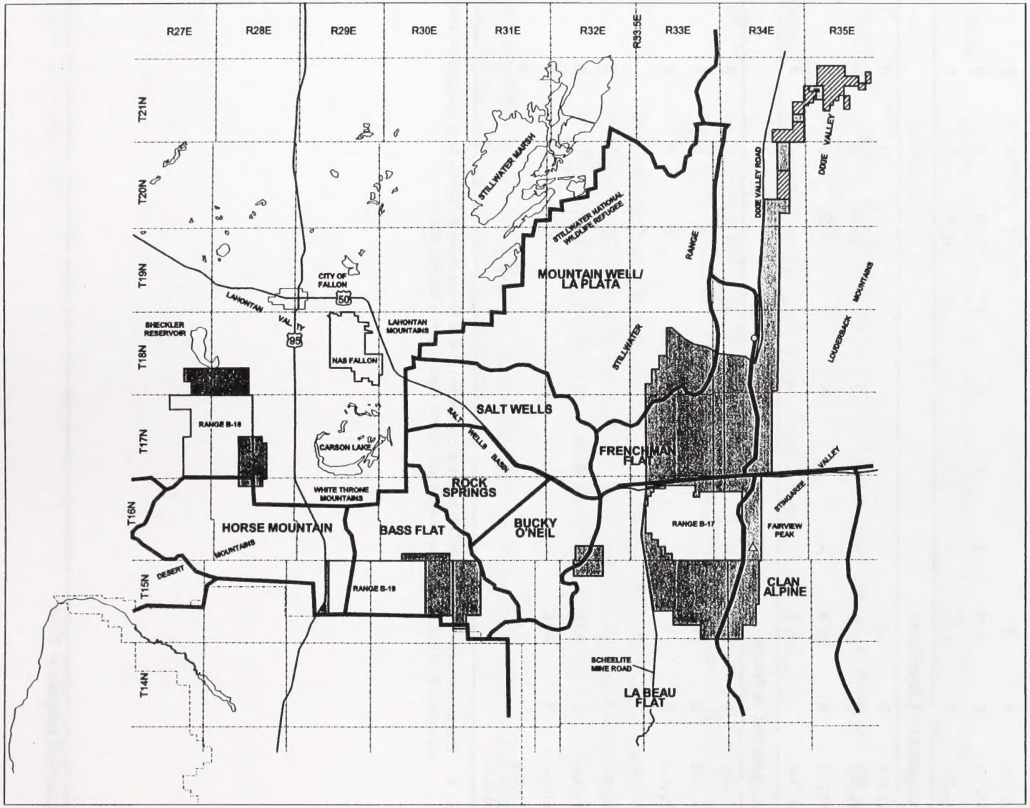
L/H-A-9 If monitoring demonstrates that the above management practices are not successful in preventing wild horse encroachment onto Category A or B lands outside the existing herd management areas, build and maintain boundary fence at appropriate locations.

The applicability of each management objective, direction, and action to the specific areas included in the withdrawn lands is summarized in Table 8.

Table 8. Applicable Management Objectives, Directions, and Actions for Livestock Grazing, and Wild Horses on Category A and B Lands by Withdrawal Area

	PROPOSED WITHDRAWAL AREA									
	B-16 N	*B-16 E*	*B-17 N*	*B-17 S*	*B-17 E*	*B-17 W*	*B-19 E*	*B-19 W*	*Dixie Valley*	*Shoal Site*
Management Objectives										
L/H-O-1	B	B					B	B	B	B
L/H-O-2	B	B					B	B	B	B
L/H-O-3	B	A/B	A	A	A	A	A/B	B	B	B
L/H-O-4	B	A/B	A	A	A	A	A/B	B	B	B
Management Directions										
L/H-D-1	B	B					B	B	B	B
L/H-D-2	B	A/B	A	A	A	A	A/B	B	B	B
L/H-D-3	B	A/B	A	A	A	A	A/B	B	B	B
L/H-D-4[1]		A/B							B	
Management Actions										
L/H-A-1	B	A/B	A	A	A	A	A/B	B	B	B
L/H-A-2	B	B					B	B	B	B
L/H-A-3	B	B					B	B	B	B
L/H-A-4							B			B
L/H-A-5	B	B					B	B	B	B
L/H-A-6	B	A/B	A	A	A	A	A/B	B	B	B
L/H-A-7	B	A/B	A	A	A	A	A/B	B	B	B
L/H-A-8		A/B							B	
L/H-A-9[1]		A/B							B	

Notes: 1. This measure would apply to any site where encroachment of wild horses or burros outside herd management areas has occurred. B-16 E and Dixie Valley are the withdrawal areas closest to existing HMAs.



LEGEND

☐ NAS Fallon and Ranges
▨ Proposed Withdrawal Areas
▨ Navy Owned Land in Dixie Valley
— Grazing Allotment Boundary
□ Water Storage (Tank, Trough)
○ Water Storage (Well, Spring Development)
△ Guzzler

N

0 5 10 Miles

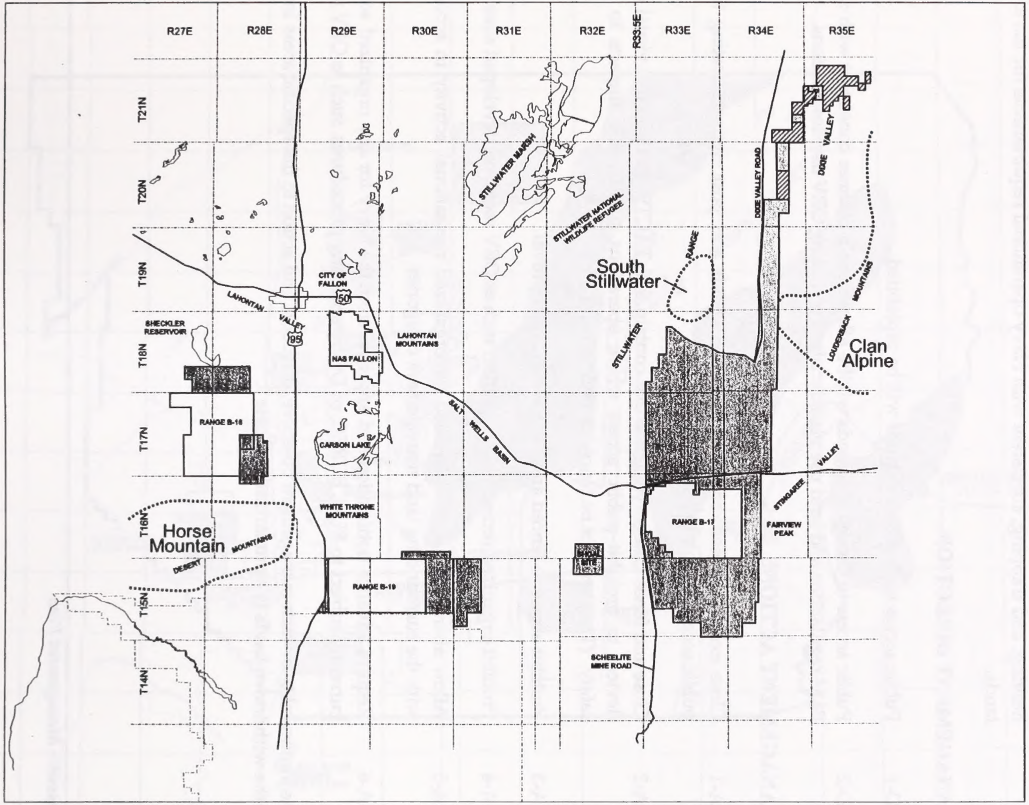
Grazing allotments exist over most of the land proposed for withdrawal.

Grazing Allotments and Water Developments

NAS Fallon, Nevada

Figure 7

Source: Department of the Navy 1997



LEGEND

☐ NAS Fallon and Ranges

░ Proposed Withdrawal Areas

▨ Navy Owned Land in Dixie Valley

······ Herd Management Area Boundary

N

0 5 10 Miles

The Wild Horses and Burros Protection Act of 1972 requires the Secretary of the Interior to protect and preserve wild and free-roaming horses and burros through management of land administered by the BLM.

Wild Horse Herd Management Areas

NAS Fallon, Nevada

Figure 8

Source: Department of the Navy 1997

RECREATION, WILDERNESS, HUNTING AND TRAPPING

Important recreational resources in the project area are shown in Figure 9.

MANAGEMENT OBJECTIVES

R-O-1 To avoid adverse impacts to wilderness study areas or wilderness areas, including Job Peak WSA near Dixie Valley.

R-O-2 To allow safe public access to Category B lands for the purpose of dispersed recreation, hunting, and trapping, consistent with Navy operational requirements for the affected lands.

MANAGEMENT DIRECTION

R-D-1 Public access to Category A lands will be prohibited.

R-D-2 Public access to Category B lands will be allowed in a manner consistent with current BLM regulations and land use plan decisions including ORV use designations.

MANAGEMENT ACTIONS

R-A-1 Close existing access roads to Category A lands and post signs indicating that all public access is prohibited.

R-A-2 Close and fence Category B lands that contain EW, TACTS, and portable visual cueing devices to prohibit public access where operations could cause impacts to public safety. (They will not be fenced in remote areas.)

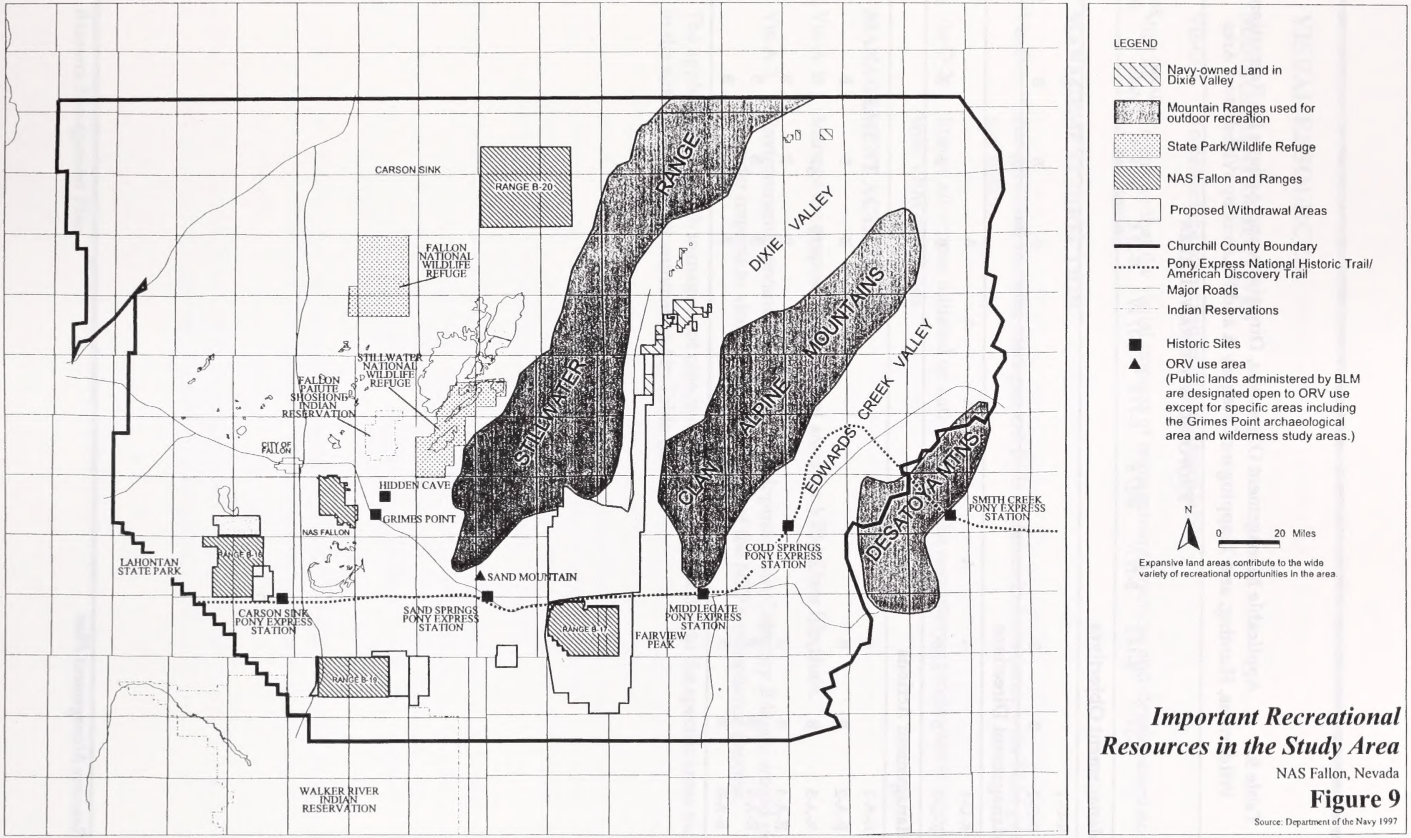
R-A-3 Prohibit access to fenced areas without Navy approval.

R-A-4 Prohibit organized recreational activities, such as ORV races, on developed sites.

R-A-5 Allow abandoned sites to be used for organized recreational activity in accordance with the surrounding land management categories.

R-A-6 Require advance notification and approval from the Navy for any organized activities currently subject to BLM, BUREC, or DOE permitting procedures, such as ORV races.

The applicability of each management objective, direction, and action to the specific areas included in the withdrawn lands is summarized in Table 9.


LEGEND
▨ Navy-owned Land in Dixie Valley
▨ Mountain Ranges used for outdoor recreation
▨ State Park/Wildlife Refuge
▨ NAS Fallon and Ranges
☐ Proposed Withdrawal Areas
Churchill County Boundary
Pony Express National Historic Trail/ American Discovery Trail
Major Roads
Indian Reservations
■ Historic Sites
▲ ORV use area (Public lands administered by BLM are designated open to ORV use except for specific areas including the Grimes Point archaeological area and wilderness study areas.)
N
0 20 Miles
Expansive land areas contribute to the wide variety of recreational opportunities in the area.
CARSON SINK
RANGE B-20
FALLON NATIONAL WILDLIFE REFUGE
STILLWATER NATIONAL WILDLIFE REFUGE
FALLON PAIUTE SHOSHONE INDIAN RESERVATION
CITY OF FALLON
HIDDEN CAVE
GRIMES POINT
NAS FALLON
RANGE B-16
LAHONTAN STATE PARK
CARSON SINK PONY EXPRESS STATION
SAND MOUNTAIN
SAND SPRINGS PONY EXPRESS STATION
RANGE B-17
RANGE B-19
FAIRVIEW PEAK
MIDDLEGATE PONY EXPRESS STATION
COLD SPRINGS PONY EXPRESS STATION
SMITH CREEK PONY EXPRESS STATION
WALKER RIVER INDIAN RESERVATION
STILLWATER RANGE
DIXIE VALLEY
CLAN ALPINE MOUNTAINS
EDWARDS CREEK VALLEY
DESATOYA MTNS.

Important Recreational Resources in the Study Area

NAS Fallon, Nevada

Figure 9

Source: Department of the Navy 1997

Table 9. Applicable Management Objectives, Directions, and Actions for Recreation, Wilderness, Hunting, and Trapping on Category A and B Lands by Withdrawal Area

	PROPOSED WITHDRAWAL AREA									
	B-16 N	*B-16 E*	*B-17 N*	*B-17 S*	*B-17 E*	*B-17 W*	*B-19 E*	*B-19 W*	*Dixie Valley*	*Shoal Site*
Management Objectives										
R-O-1									B	
R-O-2	B	B					B	B	B	B
Management Directions										
R-D-1		A	A	A	A	A	A			
R-D-2	B	B					B	B	B	B
Management Actions										
R-A-1		A	A	A	A	A	A			
R-A-2	B	B					B	B	B	B
R-A-3	B	A/B	A	A	A	A	A/B	B	B	B
R-A-4	B	B					B	B	B	B
R-A-5	B	B					B	B	B	B
R-A-6	B	B					B	B	B	B

VISUAL RESOURCES

MANAGEMENT OBJECTIVES

Vis-O-1 To protect the scenic values of withdrawn lands.

Vis-O-2 To ensure that the visual impacts of management practices and development activities are minimized.

MANAGEMENT DIRECTION

Vis-D-1 Assign visual resource management (VRM) classes in accordance with BLM guidance and policy.

Vis-D-2 Ensure all actions initiated or authorized by the regulatory agencies are in compliance with VRM guidelines.

MANAGEMENT ACTIONS

Vis-A-1 Manage the proposed withdrawal areas for VRM Class III values.

Vis-A-2 Environmental review of proposed developments on Category B lands would need to consider impacts to visual resources as part of the NEPA compliance process.

The applicability of each management objective, direction, and action to the specific areas included in the withdrawn lands is summarized in Table 10.

Table 10. Applicable Management Objectives, Directions, and Actions for Visual Resources on Category A and B Lands by Withdrawal Area

	PROPOSED WITHDRAWAL AREA									
	B-16 N	*B-16 E*	*B-17 N*	*B-17 S*	*B-17 E*	*B-17 W*	*B-19 E*	*B-19 W*	*Dixie Valley*	*Shoal Site*
Management Objectives										
Vis-O-1	B	A/B	A	A	A	A	A/B	B	B	B
Vis-O-2	B	A/B	A	A	A	A	A/B	B	B	B
Management Directions										
Vis-D-1	B	A/B	A	A	A	A	A/B	B	B	B
Vis-D-2	B	B					B	B	B	B
Management Actions										
Vis-A-1	B	A/B	A	A	A	A	A/B	B	B	B
Vis-A-2	B	B					B	B	B	B

CULTURAL RESOURCES

MANAGEMENT OBJECTIVES

C-O-1 To conserve and protect archeological and historical sites in the project area, as well as those objects, structures, and sites of traditional cultural importance.

MANAGEMENT DIRECTION

C-D-1 Cultural resources will be managed in accordance with the NAS Fallon Cultural Resources Management Plan (CRMP) and the Programmatic Agreement (PA) with the Advisory Council and State Historic Preservation Office (SHPO) for Navy actions.

C-D-2 The BLM, BUREC, or DOE, with the cooperation of the Navy, will be responsible for compliance with cultural resource preservation laws for non-Navy actions on withdrawn lands.

MANAGEMENT ACTIONS

C-A-1 Field investigations generally will not be allowed on Category A lands.

C-A-2 Field investigations will be conducted on Category B lands in the planning stages of ground disturbing activities.

C-A-3 Prior to siting a Navy or non-Navy facility or activity having the potential to affect cultural resources, NAS Fallon would use the Carson Desert predictive model to determine the potential for cultural resources on withdrawal lands. The Navy would attempt to avoid those areas potentially containing cultural resources when siting military equipment and when conducting air and ground training operations. Where areas cannot be avoided, cultural resource survey will be conducted, and, if appropriate, consultation and mitigation will be undertaken.

C-A-4 Where feasible and prudent, alternatives to avoid affecting cultural resources will be implemented for non-Navy actions; where this is not possible, the comments of the Advisory Council on Historic Preservation will be sought in accordance with its regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act.

C-A-5 EW, TACTS, and visual cueing sites will be located to avoid culturally sensitive areas, based upon the results of project-specific cultural resource surveys conducted for each potential site.

C-A-6 Field investigations will be conducted on Category A and B lands in the planning stages of ground disturbing activities by integrated training actions.

The applicability of each management objective, direction, and action to the specific areas included in the withdrawn lands is summarized in Table 11.

Table 11. **Applicable Management Objectives, Directions, and Actions for Cultural Resources on Category A and B Lands by Withdrawal Area**

	PROPOSED WITHDRAWAL AREA									
	B-16 N	*B-16 E*	*B-17 N*	*B-17 S*	*B-17 E*	*B-17 W*	*B-19 E*	*B-19 W*	*Dixie Valley*	*Shoal Site*
Management Objectives										
C-O-1	B	A/B	A	A	A	A	A/B	B	B	B
Management Direction										
C-D-1	B	A/B	A	A	A	A	A/B	B	B	B
C-D-2	B	B					B	B	B	B
Management Actions										
C-A-1		A	A	A	A	A	A			
C-A-2	B	B					B	B	B	B
C-A-3	B	A/B	A	A	A	A	A/B	B	B	B
C-A-4	B	A/B	A	A	A	A	A/B	B	B	B
C-A-5	B	B					B	B	B	B
C-A-6	B	B					B	B	B	B

REFERENCES CITED

U. S. Dept. of the Navy. 1997. *Draft Environmental Impact Statement, Withdrawal of Public Lands for Range Safety and Training Purposes Naval Air Station Fallon, Nevada.* June.

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